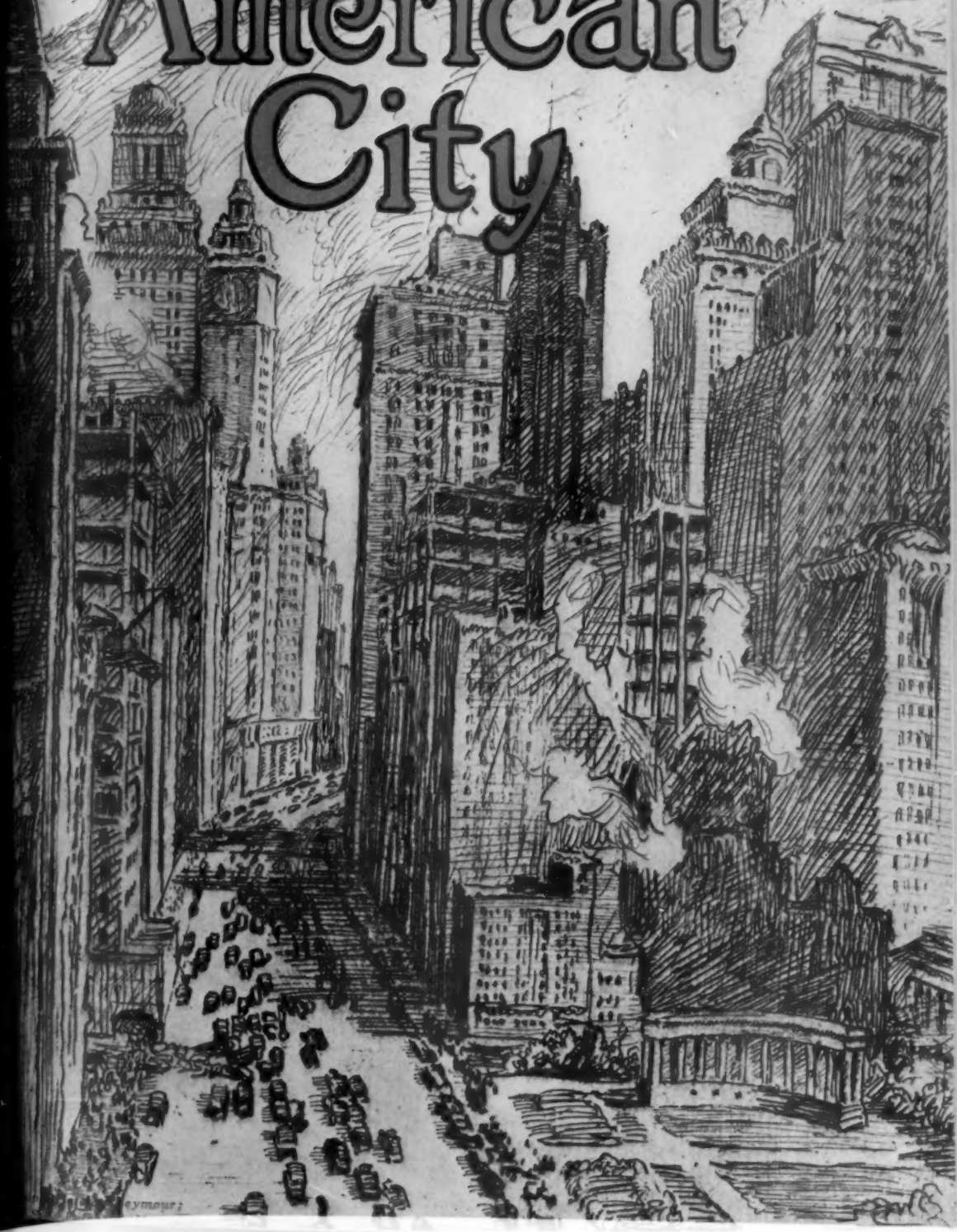
JUN 8 1927

Super-Congestion Inevitable?
(See pages 800 to 803)

JUNE, 1927
Vol. XXXVI No. 6
50 Cents $4 a Year

PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

The American City



So many communities get rid of Mud and Dust

in this way

Are you troubled with muddy and dusty roads or streets?

If so, follow the example of many other communities. A fraction of a gallon of asphaltic surfacing material to the square yard succeeds in forming a thin, waterproof mat on your road surface which is not only dustless and mudless, but is capable of holding its own against a fair amount of traffic.

There is a group of TEXACO Road Surfacing Materials, each somewhat different from the others, each suited to use on a certain kind of road surface. Whether you have plain earth, sand-clay, gravel, macadam, shell, cinder, or a similar type of road, one of these TEXACO products will meet the requirements.

If you are annoyed and inconvenienced by muddy and dusty road surfaces, it is not a costly proposition to eliminate these evils, which are also detrimental to your community's reputation.

Let us send you our booklet

TEXACO SURFACING MATERIALS

New York
Philadelphia
Richmond
Boston
Jacksonville

THE TEXAS COMPANY, U.S.A.

Asphalt Sales Department

17 Battery Place, New York City

Chicago
Cleveland
Kansas City
Dallas
Houston

Vol. XXXVI. No. 6 THE AMERICAN CITY, June, 1927 Price, 50 Cents; $4 a Year
Entered as second-class matter. April 16, 1923, at the Post Office at New York, N. Y., under Act of March 3, 1879.
Issued Monthly by American City Magazine Corporation, 443 Fourth Ave., New York. Printed in U. S. A.

Index to ***Contents of this issue, page 79;*** ***Semi Annual Index last eight pages***

Types of Cast Iron Culvert Installations

Use deLavaud Centrifugally Cast Culverts for Permanence . . . and Economy

THE great compressive strength of deLavaud cast iron culverts is an important point where a heavy fill exists.

Their light weight makes them easy to handle and install—the smooth interior surface produced by the deLavaud centrifugal method of casting gives them an increased run-off capacity.

Many construction engineers specify cast iron culverts on account of their high resistance to corrosion. Their strength results in permanence and the elimination of maintenance costs.

Write for full details

United States Cast Iron Pipe and Foundry Company

General Offices:
Burlington, New Jersey

SALES OFFICES

Philadelphia: 1421 Chestnut St.
Chicago: 122 So. Michigan Blvd.
Birmingham: 1st Ave. & 20th St.
Buffalo: 957 East Ferry Street
Cleveland: 1150 E. 26th Street
New York: 71 Broadway
San Francisco: 3rd & Market Sts.
Pittsburgh: 6th & Smithfield Sts.
Dallas: Akard & Commerce Sts.
Kansas City: 13th & Locust Sts.
Minneapolis: 6th St. & Hennepin Ave.

Index to Advertisements in this issue, page 184

DIVERSIFIED CATALOGS

THE AMERICAN CITY should always be mentioned when writing for this material which is furnished free of charge. Officials who check over these items each month and write for such printed matter as interests them will find this a convenient way of keeping their information files up to date.

A HIGH-LIFT ROAD GRADER

The Rome grader with high-lift blade which can be quickly adjusted to a practical bank-sloping position and which has many other distinctive features of value in road grading and construction, is completely described in the literature of Dept. 2, Rome Mfg. Co., Rome, N. Y.

A NEW SLUDGE PUMP

The Vevac pump which is designed for raising sludge from catch-basins or for servicing flooded manholes without labor and without power except that of water pressure and which has no moving parts, is described in literature which you may secure from the Self-Propelling Nozzle Co., Inc., 97 Water St., New York.

COLD PATCH ASPHALT

Standard cold patch asphalt—Socony Brand—for repairing bituminous roads economically and lastingly is described in the literature of the Standard Oil Co. of New York, 26 Broadway, New York.

STEEL CONSTRUCTION

Information regarding steel, which is the most economical, durable, fool-proof, strong and safe building material, is discussed in the new Fact-Book, "Steel Never Fails," which may be secured from Lee H. Miller, Chief Engineer, American Institute of Steel Construction, Inc., 285 Madison Ave., New York.

BRANDED TIRES ARE NOT STOLEN

The Everhot Mfg. Co., Maywood, Ill., will be pleased to send full details and prices of the Everhot tire-branding outfit, which prevents the switching of tires from city-owned cars to private vehicles. Branded tires stay with the city.

DIESEL ENGINES WIN WHERE STEAM LOSES

The McIntosh & Seymour Corp., Auburn, N. Y., will be pleased to furnish information to city officials showing how in many instances diesel engine power-plants have proved profitable where steam installations have failed.

ACETYLENE LIGHTS FOR EMERGENCY WORK

Carbic lights, which burn twelve hours, maintain a uniform gas pressure, do not over-generate, and are used by municipal departments and contractors for emergency night work, are completely described in the latest literature of the Carbic Mfg. Co., Duluth, Minn.

ROLLERS THAT HELP TO FINISH THE JOB ON TIME

Catalog A issued by the Buffalo-Springfield Roller Co., Springfield, Ohio, describes Buffalo-Springfield rollers of all types and sizes with or without scarifier attachment, which help to finish the job on time.

CAST IRON PIPE INSPECTION

A booklet describing cast iron pipe inspection, including the individual inspection of each length of pipe and the witnessing of hydrostatic tests offered at the point of manufacture, as made by Robert W. Hunt Co., engineers, 2200 Insurance Exchange Bldg., Chicago, Ill., may be secured from this company.

AIR-LIFT PUMPS FOR WELLS

The Indiana Air Pump Co., Indianapolis, Ind., will be pleased to receive inquiries regarding your pumping problems and tell you how they can be overcome through the use of Economy air-lift pumps, which greatly increase the yield of old wells, clean out wells, handle gritty water, and are easy to install and simple in construction, having no valves nor moving parts.

GRAVITY FILTRATION PLANTS

The International Filter Co., 333 W. 25th Pl., Chicago, Ill., manufacturers of water-softening and filtration plants, will gladly send complete information and prices regarding these plants to interested water-works officials.

REINFORCED CONCRETE PIPE

Full information and details regarding Newark reinforced concrete pipe, which has a type of joint which is said to be the cheapest form of joint to lay properly, may be secured without obligation from the Newark Concrete Pipe Co., 462 Broad St., Newark, N. J.

DIESEL ENGINES FOR MUNICIPAL SERVICE

Busch-Sulzer Bros. Diesel Engine Co., St. Louis, Mo., will be pleased to send complete information and prices regarding Busch-Sulzer diesel engines for all municipal services.

CHEMICALS FOR WATER PURIFICATION AND SEWAGE TREATMENT

Liquid chlorine in single-unit tank-cars, multi-unit tank-cars and 150-pound cylinders, chloride of lime and sulphate of alumina for water purification and the treatment of sewage, are described in literature which may be secured from the Pennsylvania Salt Mfg. Co., Widener Bldg., Philadelphia, Pa.

POLICE, FIRE AND MUNICIPAL BADGES

A fully illustrated catalog describing Braxmar police, fire and municipal badges made in all metals will be sent on request by the C. G. Braxmar Co., Inc., 242 W. 55th St., New York.

HEAVY-DUTY TURBINE WATER-METERS

The Badger Turbine heavy-duty water-meters are claimed to deliver more water at a given pressure, or the same amount of water with less loss of line pressure, than ordinary meters of their size. Full information and prices may be secured from the Badger Meter Mfg. Co., Milwaukee, Wis.

COMPLETE LIGHTING CATALOG

The Casey-Hedges Co., Chattanooga, Tenn., will gladly send prices and a copy of its complete lighting catalog to municipal officials interested in lamp-posts, service-boxes and valve-boxes.

SEPTIC TANKS FOR UNSEWERED DISTRICTS

Full information regarding San-Equip water-tight, rust-proof and unbreakable septic tanks for installation in any unsewered buildings may be secured from the Chemical Toilet Corp., Syracuse, N. Y.

VALVES AND SLUICE-GATES

Flap- or drain-valves, plug-valves, sluice-gates, and shear-valves are manufactured by the Coldwell-Wilcox Co., Water St., Newburgh, N. Y., from which information and prices may be secured on request.

PUMPS AND WELL STRAINERS

A. D. Cook, Inc., Lawrenceburg, Ind., manufacturers of deep-well pumps and the Cook patent brass tube well strainer, will be pleased to send information on these products to interested municipal officials.

PLAYGROUND APPARATUS THAT INVITES PLAY

Under the heading "Let's Play," the Patterson-Williams Mfg. Co., 551-557 W. San Fernando St., San Jose, Calif., offers its interesting illustrated catalog No. 7, which describes a very complete line of well-built, safe, playground apparatus.

SPIRAL RIVETED PIPE

Root spiral-riveted pipe, of unusual strength and integrity and suitable for water-works service because of its durable qualities, is completely described in Catalog No. 59 which may be secured from the Abendroth & Root Mfg. Co., Newburgh, N. Y.

NON-PULSATING DEEP-WELL PUMPS

The Luitweiler system of non-pulsating pumping machinery for deep wells built for city, village and corporate water-works, is completely described in Catalog 926 which may be secured gratis from the Luitweiler Pumping Engine Co., Rochester, N. Y.

See additional items on page 6

SEVENTEEN LAYNE UNITS

SUPPLY WATER TO

HOUSTON, TEXAS---

at a saving of more than 40% over their old system which was Air Lift.

The Layne System is ECONOMICAL, DEPENDABLE and SAFE. Surface water cannot enter a Layne well.

Layne engineers will gladly submit plans and estimates for improving your water supply without obligation on your part.

Layne & Bowler Manufacturing Co.

HOUSTON MEMPHIS LOS ANGELES

DIVERSIFIED CATALOGS

You can secure any or all of these catalogs free of charge if you mention The American City

VALVES AND HYDRANTS

Full details regarding the Eddy valve, which has a number of distinctive features, including the fact that the gates are free to revolve on the trunnions, so as not always to sent in the same position, and information regarding the well-known Eddy hydrant, may be secured from the Eddy Valve Co., Waterford, N. Y.

SWIMMING-POOL CLEANERS

Bulletin No. 570 issued by the Everson Filter Co., 647 No. Green St., Chicago, Ill., a copy of which will be sent free on request, describes the Everson suction swimming-pool cleaner, which makes it easy to keep swimming pools clean and sanitary.

RELIABLE AND DURABLE TRAFFIC GUIDES

The Elkhardt Foundry & Machine Co., Elkhart, Ind., will be pleased to send a copy of its illustrated folder describing the Lehman traffic guide, to interested municipal officials.

FINDING LEAKS IN WATER PIPES

The Geophone, a scientific, sensitive and practical device for finding leaks in water-mains and sewers through the detection of sound, is manufactured by the Empire Electric & Water Co., Inc., 452 Lexington Ave., New York, from which complete information may be secured on request.

FIRE-HOSE

The Fabric Fire Hose Co., 9-15 Park Place, New York, patentees and sole manufacturers of wax and para gum treated cotton rubber-lined fire-hose, will send complete information on this product to interested officials on request.

SIMPLE, ACCURATE, DURABLE METERS

Federal meters, which have such features as large-capacity registers, non-leaking stuffing-box of the internal type, extra-heavy oil-enclosed gear-train which is lubricated without removal from the meter, breakable cast iron bottom, rendering the meter frost-proof, and accurate on all flows, are described in the literature of the Federal Meter Corp. East Orange, N. J.

DEEP-WELL PUMPS FOR HEAVY, CONTINUOUS SERVICE

Copies of Catalog No. 6 describing Downie deep-well pumps for heavy, continuous service in deep artesian wells, and of Catalog 801 illustrating and describing Downie single and multi-stage centrifugal pumps, will be sent without obligation by the Keystone Driller Co., Beaver Falls, Pa.

MOTOR PICK-UP STREET SWEEPERS

The descriptive catalog of the Kinney Mfg. Co., Boston, Mass., contains complete information regarding the Kinney-Springfield motor pick-up sweeper, which covers all the most exacting requirements of up-to-date sanitary street cleaning by the method of sweeping and is the most economical and efficient method of street cleanliness.

LEAD-LINED IRON PIPE AND FITTINGS

The Lead Lined Iron Pipe Co., Wakefield, Mass., will be pleased to send complete information and prices regarding Wakefield galvanized amalgamated lead-lined iron pipe and fittings, which are low in cost, easily installed and permanent.

PUMPING MACHINERY FOR EVERY SERVICE

Complete details and information regarding Lecourtenay centrifugal pumps, as well as pumping machinery for every kind of pumping service, may be secured from the Lecourtenay Co., 8 Maine St., Newark, N. J.

HIGHWAY MARKING MACHINES

The Line-O-Graph Co., 17 E. 42nd St., New York, will send complete information on its one-man machine for painting safety lines on dangerous curves, safety zones, parking spaces, and street crossings. This machine eliminates all hand painting, marks with any kind of highway paint, and makes perfect lines on any pavement.

SETTEES FOR PARKS AND PLAYGROUNDS

Park and playground officials and others interested in settees which are made for hard usage, long life, and real comfort, in many styles for every conceivable purpose, should write to the Logan Co., Inc., 310 N. Buchanan St., Louisville, Ky., for descriptions and price list of Dow settees.

DEPENDABLE FIRE-HYDRANTS

The Ludlow Valve Mfg. Co., Troy, N. Y., manufacturers of Ludlow hydrants, will be pleased to send complete data and prices on these hydrants, which are now in use in over three thousand cities whose officials can testify to their reliability and long, faithful service.

PIPE THAT IS 100 PER CENT CAST IRON

The nearest approach to a jointless line is a Universal cast iron pipe in which the joints as well as the pipe are all cast iron, so that no lead nor other jointing material is necessary, there is nothing to work loose or blow out, and the machine-tapered iron-to-iron joints stay tight. Complete information on this pipe may be secured from the Central Foundry Co., Graybar Bldg., 420 Lexington Ave., New York.

PUMPS FOR ALL MUNICIPAL PURPOSES

The Aldrich Pump Co., foot of Pine St. Allentown, Pa., manufacturers of vertical and horizontal triplex and quintuplex power pumps, will be pleased to send a copy of "Hydraulic Tables—Data 50" to city officials asking for it.

CENTRIFUGAL WATER-WORKS PUMPS

A bulletin describing American-March centrifugal water-works pumps with capacities up to 2,500 gallons per minute, either belt-driven or arranged for direct connection to any prime mover, will be sent on request by the American Steam Pump Co., Battle Creek, Mich.

POLICE, FIRE AND TRAFFIC UNIFORMS

City officials interested in police, fire and traffic uniforms of highest quality and finest tailoring at reasonable prices, should write to Department O, Maier-Lavaty Co., 2143-45 Lincoln Ave., Chicago., Ill., for descriptive catalogs and samples.

ECONOMICAL AND DURABLE WATER PIPE

The catalog of the Michigan Pipe Co., Bay City, Mich., tells all about Michigan water pipe, which is economical and durable and ideal for water-works supply, power and manufacturing plants, and railroad water-supplies.

DITCHING SNAPSHOTS AND RECORDS

The Barber-Greene Co., 515 W. Park Ave., Aurora, Ill., has just published a 32-page illustrated catalog which shows in a striking way the application of the Barber-Greene ditcher, as well as illustrating the various features of the machine and its applicability to many ditching problems.

TREES AND SHRUBS FOR CITIES

If yours is one of the cities which are planting trees for shade and to make a city beautiful, write to the Forest Nursery, Inc. McMinnville, Tenn., for a copy of its catalog describing its forest and shade trees and ornamental shrubs for city planting.

WEAR-PROOF WATER-METERS

The Van Gilder water-meter, in which not only the gear train runs in oil, but even the register itself is submerged in a pure white oil protected by unbreakable glass on a dirt and moisture-proof register box, is manufactured by the Van Gilder Water Meter Co., Pleasantville, N. J., from which information and prices may be secured.

ADJUSTABLE MANHOLE TOPS

Three-part adjustable manhole tops, which permit readjustments and replacements without disturbing pavements and which save 50 per cent on material and 90 per cent of the labor, are manufactured by the S. E. T. Valve & Hydrant Co., 50 Church St., New York, from which complete information and prices may be secured.

DATA ON ROAD-GUARD FENCING TESTS

The Cyclone Fence Co., Waukegan, Ill., will be pleased to send a copy of the complete report made at the University of Illinois on Cyclone road-guard, to determine the value of this type of guard in saving life on highways. The report contains illustrations and a complete description of the method of testing, as well as results.

TOWER CLOCKS FOR MUNICIPAL BUILDINGS

All kinds and types of tower and department clocks for municipal buildings, court-houses, city halls, libraries and churches, are made by the Seth Thomas Clock Co., 19 W. 44th St., New York, manufacturers of many of the world's largest clocks, as well as office and desk clocks known for their fine accuracy and long life.

THE USE OF STANDPIPES AND ELEVATED TANKS IN DISTRIBUTION SYSTEMS

A reprint of the excellent paper, "The Use of Standpipes and Elevated Tanks to Reinforce the Distribution System During Periods of High Demand," by Nicholas S. Hill, Jr., consulting engineer, New York City, has been prepared for distribution by the Chicago Bridge and Iron Works, 2127 Old Colony Bldg., Chicago, Ill., and may be secured by writing to that company.

See additional items on page 4

MATHIESON
Industrial Chemicals

"Lest We Forget"

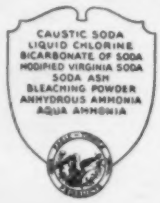
WATER chlorination, as a public health measure, is so well-established that most municipal authorities now accept it at its face value.

But as time goes on, new men come into the field—there are new minds to train—new objections to overcome.

It is therefore fitting that, periodically, municipal buyers, as a group, should be reminded that before chlorination was introduced, New York City had a death rate from typhoid fever of 13.5 per 100,000 population. After chlorination was adopted, the death rate from typhoid dropped to 2.9—a reduction of practically 79 per cent.

The experience of New York was typical of the results secured by scores of cities throughout the country. The death rate reduction as a result of chlorination was 61% in St. Louis and 89% in Philadelphia—highs and lows that indicate how large has been the average reduction.

Just as New York was one of the first American cities to employ chlorination, it was also the first city to take deliveries of Liquid Chlorine in Mathieson Multiple-Unit Tank Cars, carrying fifteen one-ton units.

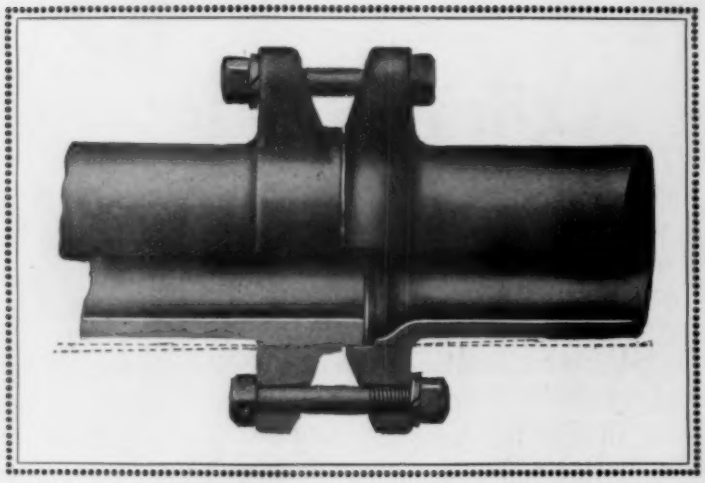


Mathieson Chlorine equipment has ever played an important part in the development of efficient water chlorination.

The MATHIESON ALKALI WORKS Inc.
250 PARK AVE. NEW YORK CITY
PHILADELPHIA CHICAGO PROVIDENCE CHARLOTTE CINCINNATI
Works: Niagara Falls, N. Y.—Saltville, Va.
Warehouse Stocks at all Distributing Centers

Deal Direct with the Manufacturer

The only 100% cast iron pipe—



. . JOINTS AS TIGHT AS THE WALL OF THE PIPE ITSELF . .

It makes its own joints: Easier to lay: Quicker to lay. No bell holes to dig: No pouring, No joints to calk. Nothing in the joints to work loose or to deteriorate.

A PIPE INSTALLATION without any joints, if such a thing were possible, would be ideal.

The nearest approach to a jointless line is a Universal Cast Iron Pipe line because the JOINTS as well as the PIPE are all CAST IRON.

No lead nor any other jointing material is necessary—nothing in its machined iron-to-iron joints to work loose, nothing to blow out.

Easily laid anywhere in any season, up hill and down, in rock, in sand, in narrow trenches—wet or dry, on bridges and under water.

UNIVERSAL CAST IRON PIPE

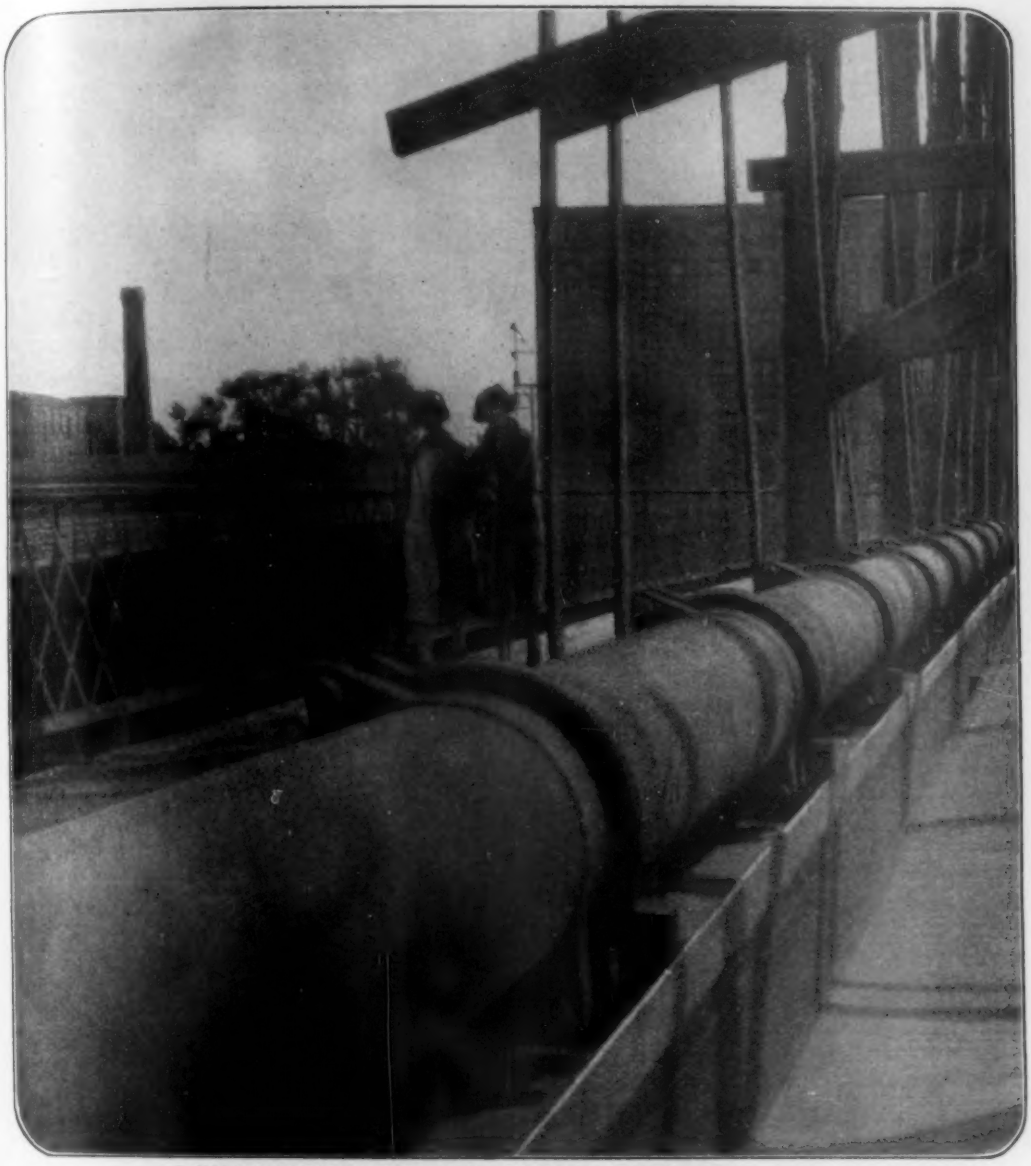
No bell holes to dig: No joints to calk

THE CENTRAL FOUNDRY COMPANY

Subsidiary of The Universal Pipe and Radiator Company

Graybar Building, 420 Lexington Avenue

Chicago Birmingham New York Dallas San Francisco



. . JOINTS AS TIGHT AS THE WALL OF THE PIPE ITSELF . .

Thousands of miles installed the country over every year, much of it by common labor.

Flexible, dependable, safe—*joints as tight as the wall of the pipe.* Wrenches the only tools.

Put your water supply, fire protection and sewage disposal problems up to us. Our nearest office is at your service.

. . . The very nature of its joint construction recommends Universal Cast Iron Pipe as a safe pipe for bridge and river crossings.

UNIVERSAL CAST IRON PIPE

No bell holes to dig. No joints to calk.

THE CENTRAL FOUNDRY COMPANY

Subsidiary of The Universal Pipe and Radiator Company

Graybar Building, 420 Lexington Avenue

Chicago Birmingham New York Dallas San Francisco

COLUMBIAN IRON WORKS

Manufacturers of

Fire Hydrants, Valves and Water Works Supplies, Meter Boxes, Valve Boxes and Sluice Gates, Municipal Castings

GENERAL OFFICES AND WORKS

CHATTANOOGA, TENN.

NEW ORLEANS, LA., REPRESENTATIVE

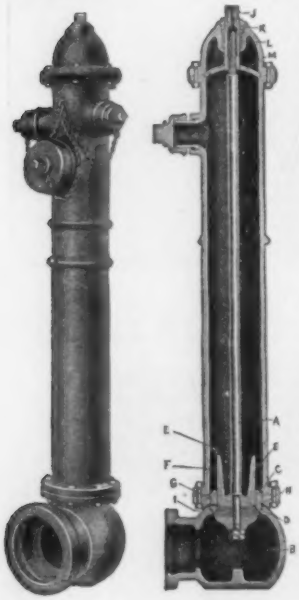
J. S. BARELLI: 612 Godchaux Bldg.

COLUMBIAN FIRE HYDRANTS

Columbian hydrants are bronze mounted, of the very best material and workmanship. All working parts and contact surfaces are accurately finished to permanent steel gauges, thereby insuring interchangeability.

Firemen and waterworks men who have had to contend with some of the more complicated fire hydrants appreciate the extreme simplicity of the Columbian hydrant. There is complete absence of any uncertain features in operating the main valve.

All working parts are removed through the top of the hydrant without disconnecting the hydrant in any manner.



The stuffing box may be repacked from the top of the hydrant without unbolting the hydrant bonnet as is necessary with some other makes of hydrants.

The removable seat ring "C" is provided with a metallic gasket at the bottom which always comes out with the seat ring. This eliminates all troubles from gaskets.

Other features of importance are the extra large diameter of the standpipe or hydrant barrel and the absence of any cross obstructions to impede the flow of the water.

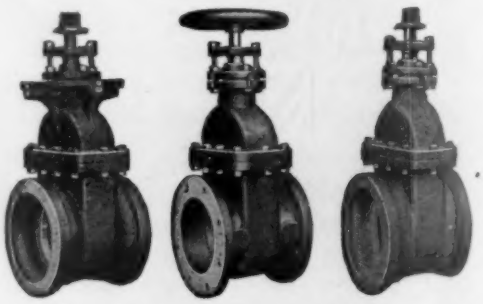
DIMENSIONS, ETC.

Nominal Size .....Inches	4	5	6
Size of Valve Opening ...Inches	4¼	5¼	6¼
Inside Diam. Standpipe...Inches	6	7	8¼
No. of 2½ Inch Hose Nozzles ..	1 to 3	1 to 3	1 to 4
No. of Steamer Nozzles	1	1 or 2	1 or 2
Size of Bottom Conn.....Inches	4 or 6	6 or 8	6 or 8
Ground to Center Hose Nozzle..	18¼	18¼	18¼
Ground to Center Steamer Nozzle	12½	12½	12½
Ground to Top of Hydrant.....	31⅛	31⅛	31⅛

COLUMBIAN VALVES

All Columbian valves are fully bronze mounted, and are of the double disc type having parallel seats. They are also furnished with bronze packing ring for stuffing boxes, bronze nuts on stuffing box bolts and malleable iron glands. These features are highly important and possessed by no other valve on the market.

Special attention is called to the wedging mechanism of Columbian valves, which works in such a way that separate discs are wedged against the valve gate at four separate points of contact and are equally distributed over the area of the valve discs. This reduces to a minimum the likelihood of their leaking under heavy pressure.



In closing Columbian valves, no pressure is applied to the gates until they are lowered into position directly opposite the openings of the valve, at which time the bottom wedge comes in contact with a rib in the bottom of the valve, which in turn moves up and forces the two side wedges outward, thereby holding the valve discs firmly against the valve seats.

In opening the valves, all pressure is removed from the discs before they are lifted out of position, thereby taking all strain from the valve stem, and making it practically impossible to break a Columbian valve stem. Out of the many thousand in use, we have never yet heard of a single valve stem being broken through ordinary usage.

Another important advantage is that of providing the bronze packing ring for stuffing box with malleable iron gland. This gland works on the top of the bronze packing ring with a ball joint effect, so that in screwing packing ring down in the stuffing box, even though one nut is screwed down ½ inch farther than the other, it is impossible to bind the valve stem and prevent it from turning.

All valves are tested to 300 pounds hydrostatic pressure at our plant before shipment, and certificate of such test is furnished upon request.

SHEAR GATE

MUD VALVE

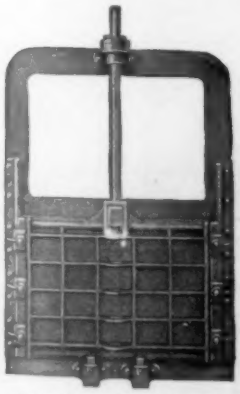
VALVE BOXES

Columbian valve boxes are of a three-piece screw adjustable type. They are extra heavy for roadway service, and have deep socket type of covering which prevents them from being accidentally knocked out of position. The boxes being screw adjustable allows them to be adjusted to exactly the correct height to come in line with the surface of the street. The smallest inside diameter is five inches. The boxes are made with different size bottom sections to fit over any size of valve.

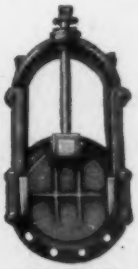
We also manufacture a style "K-2" Valve Box especially intended for use with one and one-half inch and two-inch valves. These are constructed along the same general lines as the larger boxes and the inside diameter measures four inches.

Write us for further specifications, illustrations, prices, etc.

SLUICE GATE VALVES

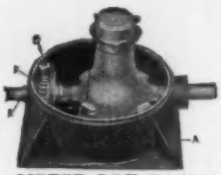


RECTANGULAR TYPE



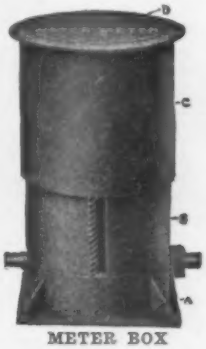
CIRCULAR TYPE

COLUMBIAN METER BOX



METER BOX BASE

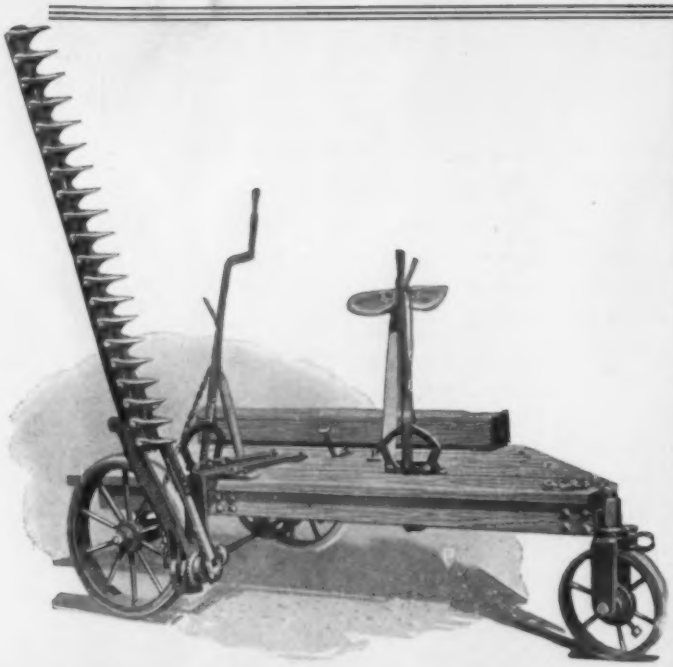
Showing Meter in Position (E) Adjustable Bronze Coupling; (F) Worm Nut; (G) Worm Screw.



METER BOX

Fig. No. 1443 (A) Base; (B) Lower Casing; (C) Upper Casing; (D) Cover.

RAWLS All-Feature



Part for part—feature for feature—the Rawls is easily a superior mower. The Rawls is especially designed for highway use and in designing it, the problems encountered in mowing along highways were fully considered and thoroughly solved. The Rawls Highway Mower operates about four times as fast as the usual mower. It will cut at any angle through an arc of 180 degrees and will work at any position from straight up to straight down.

Whenever a Rawls gets on the job, weeds and grass in drainage ditches alongside the roadway must go—and that without resorting to the use of hand work with scythes.

The Rawls Mower is easily towed by any source of power equal to a Ford roadster or greater. The Rawls can be attached to a truck, tractor or automobile, and works at a correspondingly greater speed. It demounts automatically upon striking an obstruction.

Three to four miles of highway can be cleared on both sides in an hour.

RAWLES MANUFA

Successors to Rawle

1412 N. Halsted Street

CABLE ADDRESS: RAWLSMACHY, CHICAGO

HIGHWAY MOWER

This is the mower to use. Among many reasons are the following:

It keeps the highways looking trim and thus a good impression of the community is created on the tourist.

Keeping weeds down prevents the broadcasting of weed seeds in neighboring fields. You get proper drainage and a firm, sun-dried road bed.

You get fewer snow-drifts in winter and bring about a better spirit of civic pride in the community.

Remember—a weedy highway collection of dirt, trash and vegetation prevents proper drainage and clogs ditches and drains, softening the road bed and damaging it while developing a very unsanitary condition that is not only an eye sore to tourists but reflects upon the progressiveness of those responsible for such conditions.

Let us send full particulars and prove that a Rawls represents a good, sensible investment!

Some Enthusiastic Users of Rawls Highway Mowers

Railroads in Nine Countries:

Akron, Canton & Youngstown
Atchison, Topeka & Santa Fe
Baltimore & Ohio
Buffalo, L. Erie Trac. Co.
Buenos Aires Western Ltd.
Canadian National
Canadian Pacific
Chesapeake & Ohio
Chicago, Burlington & Quincy
Chicago & Alton
Chicago Great Western
Chicago, Indianapolis & Louisville
Chicago, Milwaukee & St. Paul
Chicago & Northwestern
Chicago, Rock Island & Pacific
Colorado & Southern
Denver & Salt Lake City
Duluth So. Shore & Atlantic
Elgin, Joliet & Eastern
Ft. Dodge, Des Moines & Southern
Ft. Worth & Denver City
Guantanamo Railway Co.
Great Northern
Illinois Central
Indiana Service Corp.
International & Gt. Northern
Kansas City, Mexico & Orient
Kansas City Southern
Louisville & Nashville
Missouri, Kansas & Texas
Minneapolis & St. Louis
Minnesota & International
Missouri Pacific
Nashville, Chattanooga & St. Louis
New York Central
Northren Pacific
San Antonio & Arkansas Pass
Southern Pacific of Mexico
Soo Line
St. Louis-San Francisco
So. New York Power & Ry. Corp.
Trinity & Brazos Valley
United Fruit Co., Panama Division
United Fruit Co., Cuba Division
United Fruit Co., Porto Rico Division
Wabash Railway

Only a Few of State, County and City Highway Departments Are Shown

Huerfano County, Colorado
Morgan County, Colorado
Apalachicola, Florida
Orange County, Florida
Minidoka County, Idaho
Kane County, Illinois
Cass County, Indiana
Tippecanoe County, Indiana
Sumner County, Kansas
Bourbon County, Kansas
Clinton County, Michigan
Allegan County, Michigan
Hennepin County, Michigan
Meeker County, Minnesota
St. Louis County, Missouri
Buchanan County, Missouri
Hoke County, North Carolina
Clatsop County, Oregon
Charleston County, So. Carolina
Kingsbury County, So. Dakota
Iron County, Wisconsin
Sheboygan County, Wisconsin
Kenosha County, Wisconsin

State Highway Departments

Arkansas
California
Florida
Georgia
Idaho
Indiana
Louisiana
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Nebraska
New Mexico
New York
North Carolina
Ohio
Oregon
South Carolina
Virginia
Washington
Wyoming

TURING COMPANY

Mach. & Mfg. Works

Chicago, Ill.

CODES: A. B. C. 5th ED. and PRIVATE

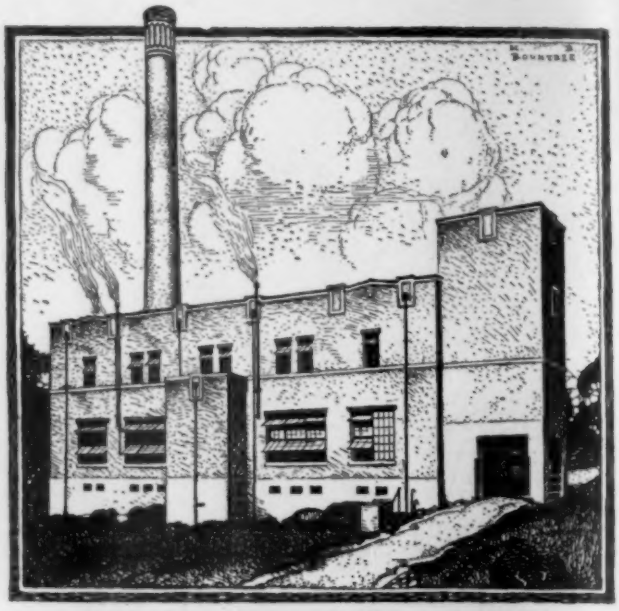
THE FUN FUL LINE
PLAYGROUND EQUIPMENT
HILL-STANDARD CO.
ESTABLISHED 1900
ANDERSON, IND., U.S.A.

THE FUN FUL LINE
SWIMMING POOL EQUIPMENT
HILL-STANDARD CO.
ESTABLISHED 1900
ANDERSON, IND., U.S.A.

DECARIE
SYSTEM of INCINERATION

For Refuse Disposal

Built entirely of steel, water-jacketed and practically indestructible.



250-ton Incinerator for the City of New York, at Betts Avenue, Long Island City

A SYSTEM for the disposal of garbage, unique in that the steel walls of the furnace are protected by a water-jacket on all sides to which the basket grate pipes are connected. Consequently the furnace becomes a steam generator, and as such furnishes, without cost, the power necessary to operate the forced and induced draft fans for the furnace. Surplus power is produced sufficient to operate pumps for water or sewage systems or for the generation of electricity.

In these plants garbage and rubbish may be fed at the same time, and the charging holes are large enough to permit objects of almost any size to pass through. In the charging operation no smoke or gas can come up through the charging hole. No fuel except the refuse itself is required.

These plants are of distinctive type and scientific design. Back of their construction is the experience of one of the oldest incinerator concerns in the United States, with 70 plants in successful operation. Take advantage of this experience.

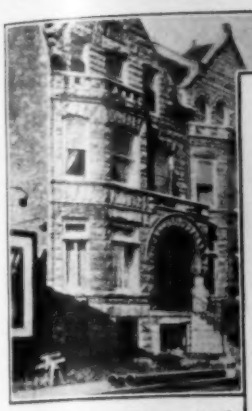
The Decarie catalog, completely illustrated, will be of marked interest to every Municipal Engineer. A copy will be sent upon request.

Decarie Incinerator Corp.

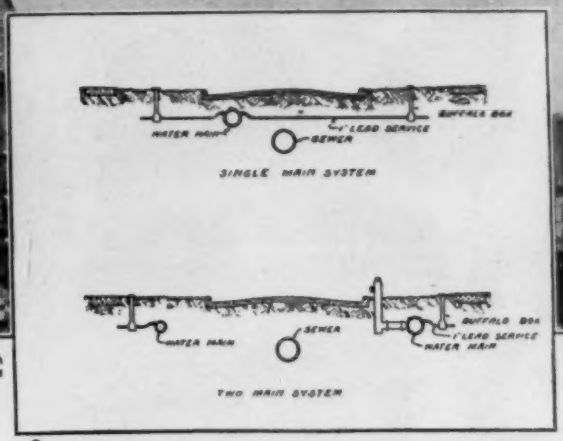
342 Madison Avenue, New York

DECARIE SYSTEM

Do you mention THE AMERICAN CITY when writing? Please do.



Michigan Avenue, Chicago—an 8-inch main on the WEST side of the street



Michigan Avenue, Chicago—an 8-inch main on the EAST side of the street

When it is cheaper to lay two mains than one

THE use of two mains in wide streets, an important new development of water and gas distribution engineering, offers many advantages. The installation cost of mains and services is less.

While the use of the system results in a greater mileage of mains, it cuts down the number of miles of services to an even greater extent.

Under the old practice with a main in the center and services to each lot, many services were installed that were never used. Many others were found inadequate to care for the needs of new buildings erected.

The result was dead services, a prolific cause of trouble and the high expense of replacing or maintaining services under pavement.

The two main system calls for a main on each side of the street in the parkway. Even when both mains are at the sides of the street the system still offers many advantages.

This Bureau has prepared complete information on the use of the two main system, including specimen diagrams and cost figures. This material will be sent free to anyone interested.

Address: RESEARCH ENGINEER
THE CAST IRON PIPE PUBLICITY BUREAU, PEOPLES GAS BUILDING, CHICAGO

CAST IRON PIPE

Our new booklet, "Planning a Waterworks System," which covers the problem of water for the small town, will be sent on request

THE BELL & SPIGOT JOINT

THE ACCEPTED STANDARD FOR UNDERGROUND CONSTRUCTION

Send for booklet, "Cast Iron Pipe for Industrial Service," showing interesting installations to meet special problems

NORWOOD

MUNICIPAL FILTERS

Safe! Efficient! Economical!

Installations include such municipalities as Niagara Falls, N. Y.; Erie, Penn.; Binghamton, N. Y.; Elyria, Ohio; Evansville, Ind.; Toledo, Ohio; Warren, Ohio; Lima, Ohio; Evanston, Ill.; Steubenville, Ohio; and Dunkirk, N. Y.

Take advantage of our cooperation
Write for information

NORWOOD ENGINEERING CO.

FLORENCE, MASSACHUSETTS

Member of Associated Manufacturers of Water Purifying Equipment

Announcing

The DORR TRACTION CLARIFIER

The Dorr Traction Clarifier is an improved and simplified continuous sedimentation unit for sewage and water treatment plants.

Improved — The sludge-raking mechanism is driven from the tank periphery.

—The mechanism is supported at the other end by a center pedestal. Result, a rugged and rigid machine.

—All bearings and wearing parts are above the water line.

Simplified—No superstructure over the tank.

—No large housing over the drive, merely a casing to protect it from the weather.

Behind the design and construction of the Traction Clarifier is the experience gained by our engineers in years of close contact with the requirements of the Sanitary Engineering field.

Send for your copy of our descriptive pamphlet No. 6171. *Write*

THE DORR COMPANY

ENGINEERS

247 PARK AVENUE NEW YORK CITY

DENVER LOS ANGELES CHICAGO WILKES-BARRE JOPLIN

THE DORR CO. LTD
16 South Street London E.C.2

DORR G. m.b.H.
Joachimsthalerstr. 10, Berlin W.15

SOC. DORR ET CIE.
126, Rue de Provence Paris 8

INVESTIGATION TESTS DESIGN EQUIPMENT

Sterling Destructor
Fifth Ave. and 139th Street
New York City

Reduced Costs for Refuse Disposal

When the final costs of refuse disposal are reckoned, Sterling Destructors show up unusually well because of the fact that they can be centrally located. These high temperature incinerators are regularly built near the center of refuse collection districts where the average haul is short and collection costs consequently low.

This central location of the Sterling Destructor is possible because of important improvements in design and construction. Most important of these is the Sterling Mutual-cell furnace which completely consumes mixed refuse. Dust, smoke, fumes and noxious odors are completely done away with by the uniformly high temperature created by this unique method of furnace construction.

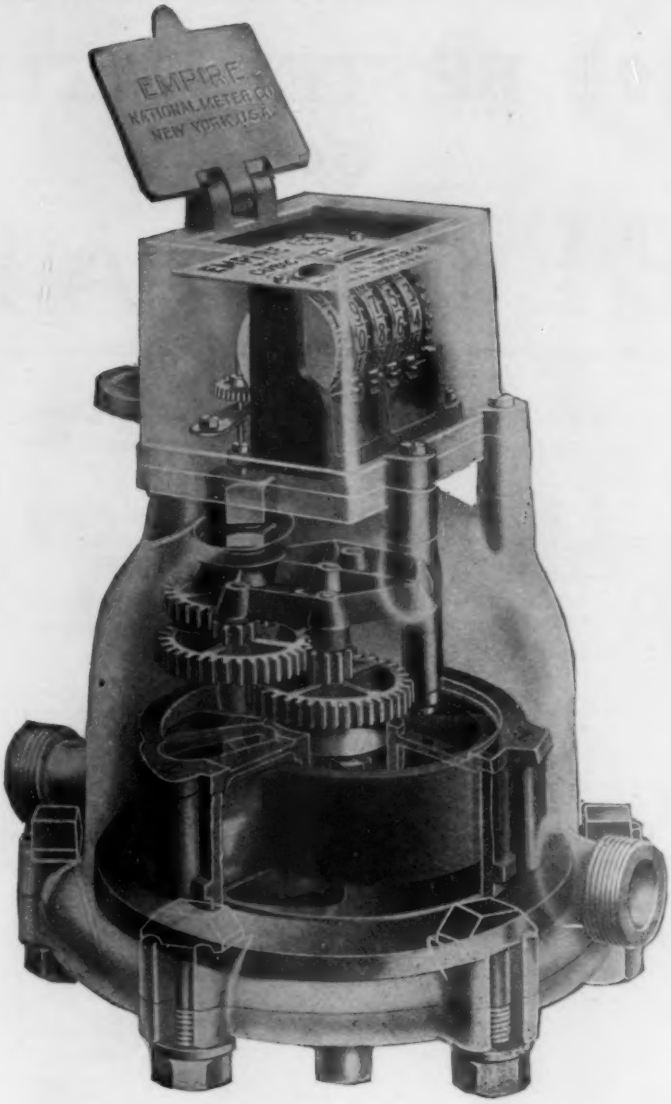
Let us send you Bulletin No. 55 which pictures and describes Sterling Destructors now operating in leading American cities. It's free to everyone interested in refuse disposal problems.

THE C. O. BARTLETT & SNOW CO.
6220 Harvard Ave. Cleveland, Ohio

Bartlett - Snow

REFUSE DISPOSAL PLANTS

You will oblige us if you will mention THE AMERICAN CITY.



EMPIRE

THE SUPREME METER

NATIONAL METER COMPANY
299 BROADWAY
NEW YORK

"THE BETTER METER"

The

FEDERAL

Do not fail to give this matter your consideration before placing your order. Note these special features:

1—Large-capacity registers.

2—Non-leaking stuffing box of the internal type.

3—Extra heavy gear train, oil-enclosed type.

4—Gear train lubricated without removal from the meter.

5—Measuring chamber of ample dimensions.

6—Breakable cast-iron bottom, rendering the meter frost-proof.

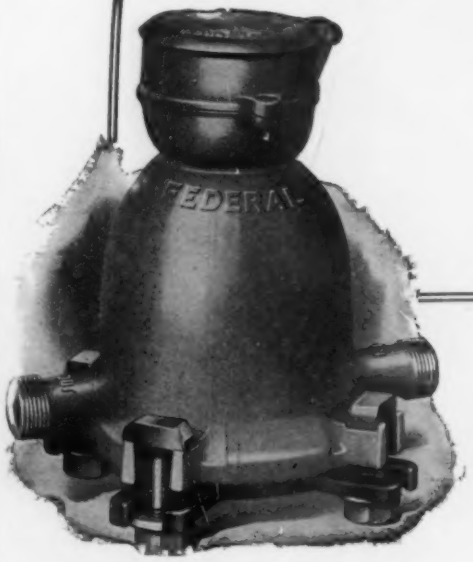
7—Accuracy on all flows, from the largest to the smallest stream.

8—Best materials obtainable used in construction.

9—Two-year guarantee against defects in material or workmanship.

10—Keynotes:

SIMPLICITY
ACCURACY
DURABILITY



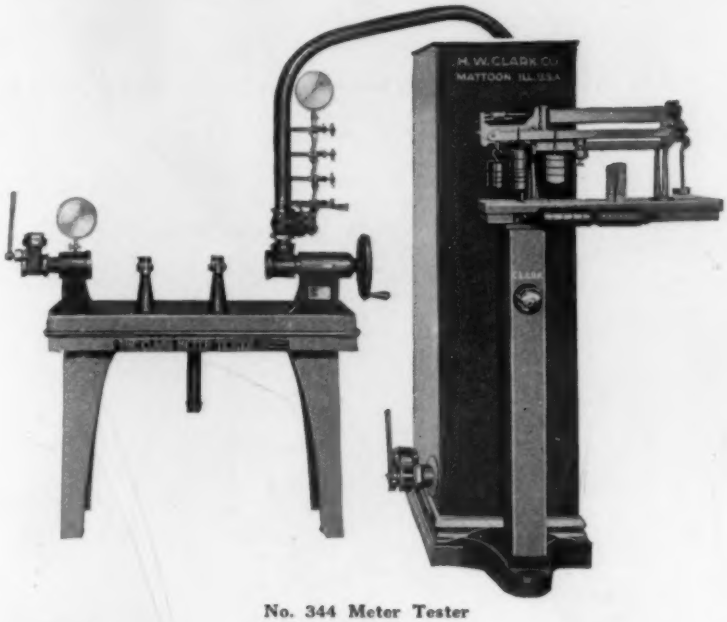
Made in ⅝-in., ¾-in., 1-in., 1½-in. and 2-in. sizes.

FEDERAL METER CORP.

EAST ORANGE, N. J.

CLARK METER TESTERS

are made in eleven sizes, all of the weighing type. Each tester is equipped with Fractional Flow Valve, Needle Point Sensibility Test Valve, Non-Splash Dial Setting Cock, Electric Alarm Bell, Quick Emptying Tank. The scale has a special beam, graduated in cubic feet, gallons and pounds, and equipped with a bar indicating the percentage of error. Even the small inexpensive Bench Mounter tests meters by weight.



No. 344 Meter Tester

CAPACITIES:

1 to 3 meters of size ⅝-inch or ⅝ x ¾-inch.
1 or 2 meters of size ¾-inch or 1-inch.
1 meter of size 1½-inch or 2-inch.
Floor tests of larger meters can be made with the Clark Hose Adapter.

Send for our new Catalog Number 27, describing Clark Meter Testers in both single and multiple types.

H. W. CLARK COMPANY

Manufacturers Water Works Equipment

MATTOON, ILLINOIS, U. S. A.

Meter Boxes
Vitrified Box Bodies
Forms for Concrete Bodies
Meter Couplings
Meter Coupling Yokes
Service Boxes
Repair Lids
Vise for Brass Pipe
Valve Boxes
Valve Housings
Meter Testing Machines
Trouble Finding Instruments

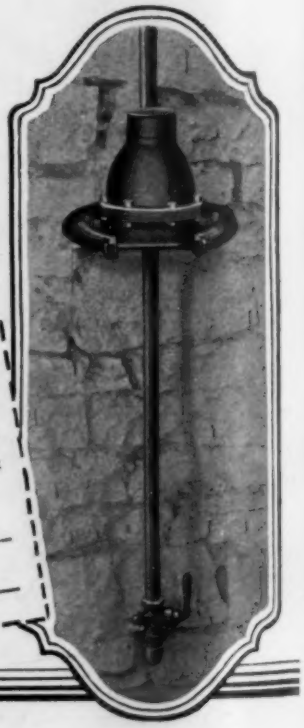
The FORD Ram's Horn Meter Holding Frame

In setting a meter in a vertical pipe in a basement, the Ford "Ram's Horn" has the advantage over any other method of piping to put the meter in the proper horizontal position:

1. Requires no pipe fittings or meter couplings.
2. Two pipe joints instead of six or eight.
3. Less time required to make setting.
4. Less time and trouble in changing meter.
5. Simpler, better looking, less cost.
6. Less frictional loss.
7. Can be had with Test Valve or without.
8. Pipe is held perfectly rigid.
9. Meter is easily sealed.

It is made for ⅝"-⅝"x¾" and ¾" meters.

Illustration below shows the very neat and strong basement installation of a Water Meter made possible by the Ford Ram's Horn meter holding frame.



The FORD METER BOX Co.
Wabash-Indiana

mail this

Ford Meter Box Co.,
Wabash, Indiana.

_____192____

Gentlemen:

We are interested in the Ford Ram's Horn Meter Holding Frame and would like to have a bulletin describing it together with prices.

____ Send sample and bill us. ____ Send complete catalog. (Check in space provided if sample is desired).

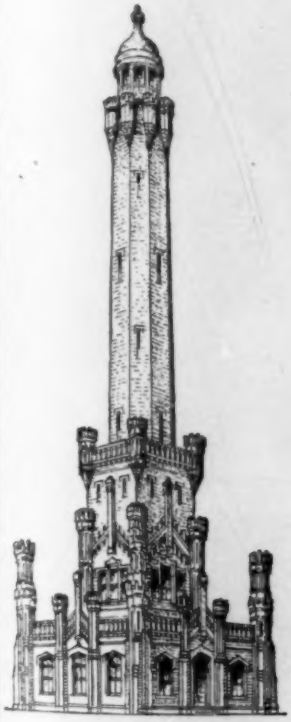
Name_____

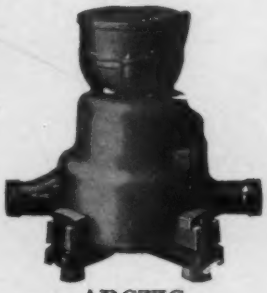
Address_____

TWO POINTS OF INTEREST AT THE A. W. W. A. CONVENTION JUNE 6 TO 11

AT the American Water Works Association Convention at Chicago, Ill., June 6 to 11, be sure to see the Chicago Water Tower and the Pittsburgh Equitable Exhibit at the Hotel Sherman.

The headquarters of the Pittsburgh Equitable Meter Company will also be at the Hotel Sherman.





ARCTIC

TROPIC

Keystone Compound

Pittsburgh Equitable Meter Co.

Pittsburgh, Pa.

BRANCH OFFICES:

New York, N. Y.
Chicago, Ill.
Kansas City, Mo.
Dallas, Texas
Los Angeles, Cal.
Columbia, S. C.
Tulsa, Oklahoma
Seattle, Washington
Salt Lake City, Utah

Successful Since Sixty-Eight

Union Corporation Curb and Waste Stops and Fittings are made of highest-grade bronze composition.

Stops will turn easily as long as in use. Each plug solid except for necessary waterway. Ground and lapped to perfect bearing. Tested under 250 pounds water pressure before shipment.

Made heavier and stronger for maximum service.
Complete catalog A-53 sent upon request.

UNION WATER METER COMPANY

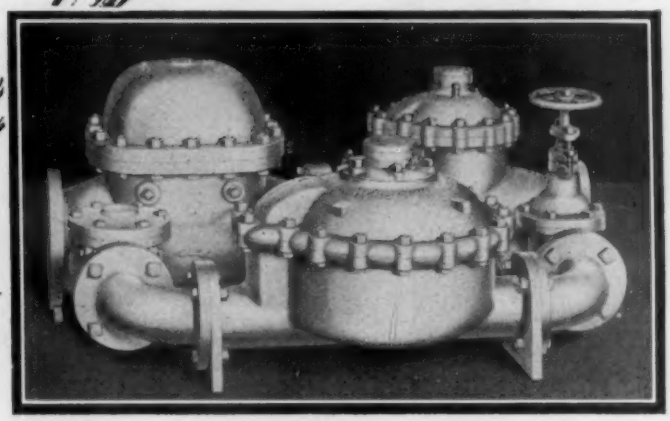
WORCESTER, MASS.

New York—50 Church St.
Philadelphia—411 Bulletin Bldg.

UNION

Water Meters - Chronometer Valves
Easy Turning Stops - Pressure Regulators
Presses for Lining Pipe - Alarm Signals

BILLIONS are Staked *on the* Dependability *of this* Meter



THE Hersey Detector Meter, for more than twenty years, has been accepted by every stock and mutual insurance company in the United States and over 800 water departments and water companies with absolutely no reservations.

The safety of billions of dollars of insured property value is staked on the dependability of this meter. It has never failed. It meets every requirement of a fire service meter. We shall be glad to send a catalog on request.

There is only one internally balanced disc water meter. That is the Hersey.

Hersey Manufacturing Company, South Boston, Mass.

HERSEY
WATER METERS

NEW YORK, N. Y.	290 Broadway
PORTLAND, OREGON	475 Hoyt St.
PHILADELPHIA, PA.	314 Commercial Trust Bldg.
ATLANTA, GA.	510 Haas-Howell Bldg.
DALLAS, TEX.	2301 Griffin Street
CHICAGO, ILL.	10 So. LaSalle St.
SAN FRANCISCO, CAL.	690 Market St.
LOS ANGELES, CAL.	450 East Third St.

Main Office and Works:
Corner E and 2nd Sts., South Boston, Mass.

MATHEWS FIRE HYDRANTS

REG. U. S. PAT. OFF.

Bronze-Lined Hydrant

If you want a hydrant that is dependable, long-wearing, frost-proof and automatically drained—

Try the Mathews

If you want a hydrant so simple in design as to assure the minimum of repairs and upkeep expense—

Try the Mathews

Mathews Fire Hydrants are made in both standard and high pressure types.—See our illustrated catalog. We also manufacture gate valves for all purposes, cast iron pipe (centrifugally cast or sand-cast), and fittings.

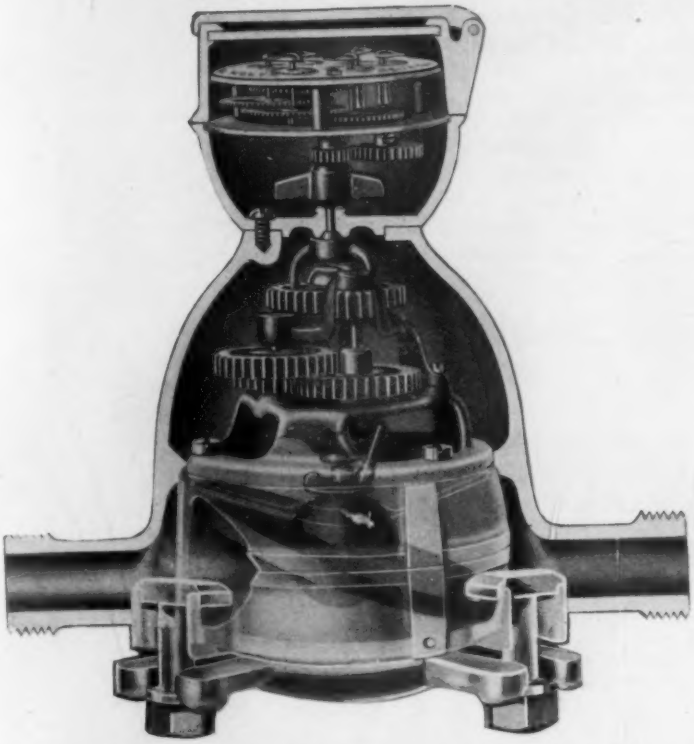
R. D. WOOD & CO.

ESTABLISHED 1803

PHILADELPHIA, PENNSYLVANIA

Yes—we should like you to mention THE AMERICAN CITY.

"WATCH DOG" WATER METERS



It is a significant fact that the three largest contracts for water meters were awarded for "Watch Dog" Water Meters. Chicago, Portland, and Detroit have each selected "Watch Dog" meters after exhaustive comparative tests.

We cordially invite you to visit our

CHICAGO OFFICE

at 360 North Michigan Avenue, and we will be pleased to give you details of "Watch Dog" design, construction, and performance.

GAMON METER COMPANY

Main Office and Works

NEWARK, N. J.

CHICAGO
360 N. Michigan Ave.

SEATTLE
2013 L. C. Smith Bldg.

PERFECT VALVE INSERTING MACHINE

Valves inserted under pressure

Turning off the water for a block or two, while repairing a break in the line, is not a serious matter. But suppose the valves are a half-mile or more apart! Too late, now, to install more valves—unless some method of inserting them under pressure is found. The *Perfect Valve Inserting Machine* will do this. It has inserted 24 in. valves successfully under pressure in Minneapolis, Philadelphia, Hammond, Ind., and Waltham, Mass.; and the smaller-size valves in hundreds of water-works systems throughout the United States and Canada. Let us send you a description of this machine.

Other Smith products

Let us send you a circular describing the O'Brien *Hydrant*, adopted by the City of New York as its standard for all future use, and now used exclusively by Washington, St. Louis, Philadelphia, Baltimore, Jersey City, Columbus and Springfield, Ohio, and other places. It is a compression hydrant with a drip attachment, which can be repaired in a few minutes' time without disturbing the stand-pipe in the ground.

It will pay you to investigate also the Smith Tapping Apparatus, Corporation Tapping Machines, Pipe-Cutting Machines, Corporation and Curb Cocks, Indicator Posts, Valves and Hydrants for low- and high-pressure service, and our Lead Melting Furnaces, etc. *Write for catalog.*

THE A. P. SMITH MFG. CO.

EAST ORANGE, N. J.

The illustration shows the No. 1 Machine for inserting 4 in., 6 in. and 8 in. valves. The No. 2 Machine inserts 8 in., 10 in. and 12 in. valves; the No. 3 size, 14 in., 16 in., 18 in. and 20 in. valves; the No. 4 size, 24 in. horizontal valves; and the No. 5 size, 30 in. valves.

KENNEDY

VALVES-PIPE FITTINGS-FIRE HYDRANTS

50th Anniversary 1877-1927

Let's Go
Chicago, 1927

A type for every water works service

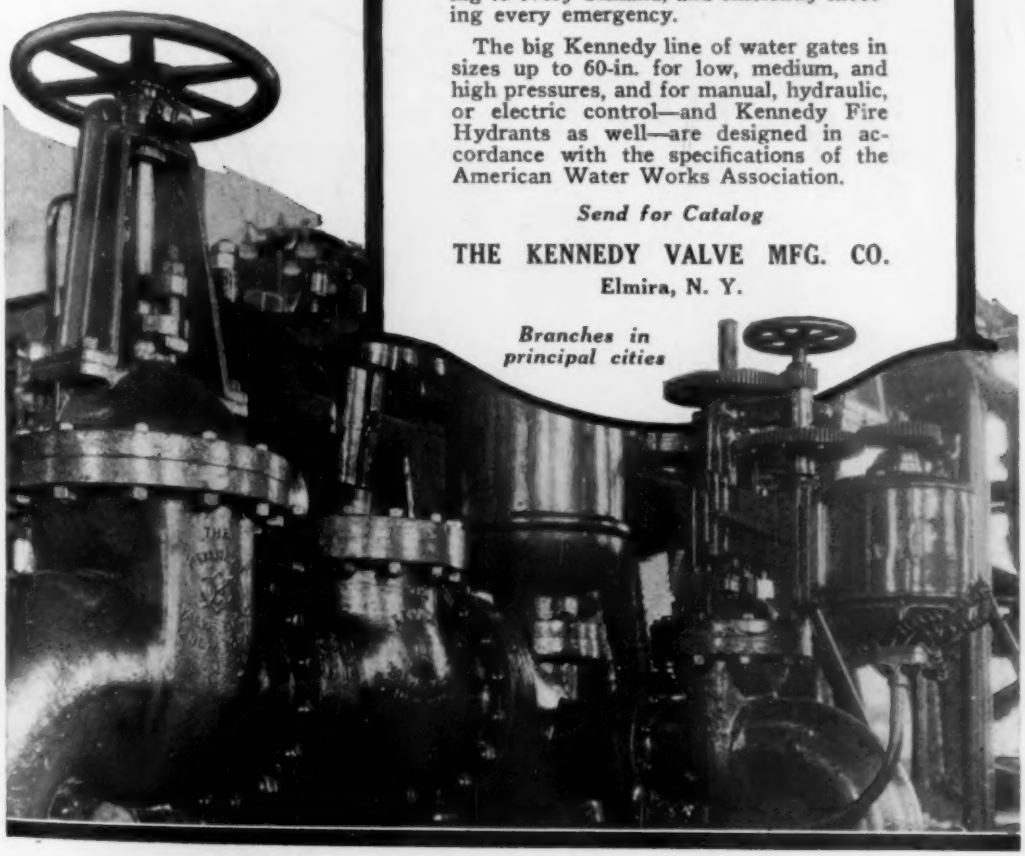
WATERWORKS superintendents all over the country can testify to the uniformly dependable service and trouble-free operation of Kennedy equipment. On the water supply and fire protection systems of hundreds of municipalities, Kennedy Valves and Fire Hydrants are giving thorough satisfaction, promptly responding to every demand, and efficiently meeting every emergency.

The big Kennedy line of water gates in sizes up to 60-in. for low, medium, and high pressures, and for manual, hydraulic, or electric control—and Kennedy Fire Hydrants as well—are designed in accordance with the specifications of the American Water Works Association.

Send for Catalog

THE KENNEDY VALVE MFG. CO.
Elmira, N. Y.

Branches in principal cities



LUDLOW
The always dependable
HYDRANT

The records made by the Ludlow Hydrant in large cities, where many other makes are also used, show no other on the market with so small an up-keep cost.

Every working part substantial—no complicated small parts—an absolutely dependable automatic drain valve at the extreme bottom that cannot be clogged—a newly patented device to prevent flooding of streets if the standpipe should be broken by team or automobile—all working parts easily removed through the top—

These are just a few of the points of excellence of the Ludlow Slide Gate Fire Hydrant.

THE LUDLOW VALVE MFG. CO.
TROY, NEW YORK

BRANCHES:
New York 62 Gold Street
Boston, 1112 Tremont Bldg.
Philadelphia, Harrison Bldg.
Pittsburgh, 815 Oliver Bldg.
Chicago, 731-733 The Rookery
Kansas City, R. A. Long Bldg.

SOUTHERN REPRESENTATIVE:
W. F. Wilcox,
Fourth Nat'l Bank Bldg.,
Atlanta, Ga.

The offices of THE AMERICAN CITY, 443 Fourth Ave., N. Y., are headquarters for information on equipment for municipal work. If you want catalogs, prices or names of manufacturers, let us help you.

EBG

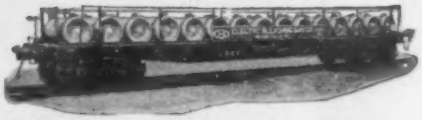
HAVE YOU READ THIS PAPER?

AN authoritative paper in connection with the treatment of sewage with Liquid Chlorine was presented by Mr. L. H. Enslow, Sanitary Engineer of the Chlorine Institute, New York City, before the Ninth Water Works Short School in Dallas, Texas, January, 1927.

This paper, entitled "Recent Developments in Sewage Chlorination," is of interest and value to all concerned with public sanitation. Copies will be gladly sent without charge upon application to Electro Bleaching Gas Co.

Liquid Chlorine

E B G container equipment fully meets the needs of sewage disposal plants as well as municipal water works. E B G Liquid Chlorine is shipped in steel cylinders of two sizes, containing approximately 100 pounds and 150 pounds of Liquid Chlorine. Water works are supplied with RED cylinders to facilitate identification and prompt shipment.



Multi Unit Tank Car

Composed of fifteen steel drums, each having a net content of 2,000 pounds of Liquid Chlorine, offers the large user of E B G Liquid Chlorine every possible advantage.

Look for the RED Cylinder

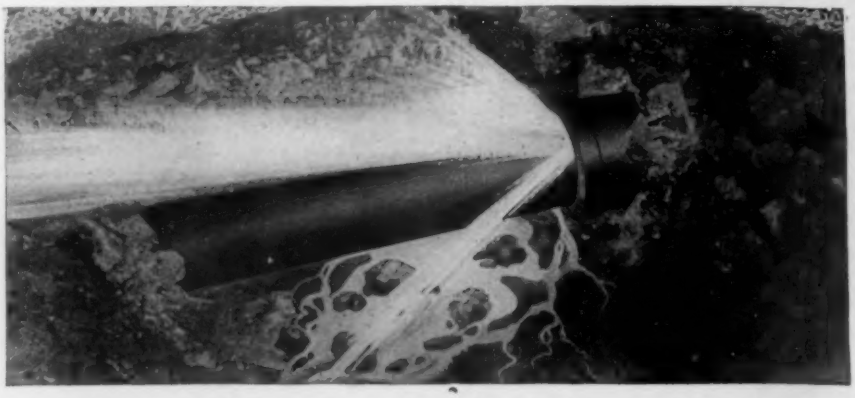
Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

Plant: NIAGARA FALLS, N.Y.

MAIN OFFICE: 9 East 41st St., New York

Affiliated with the Niagara Alkali Co., Niagara Falls, New York



OFTEN FOUND WHERE LEAST SUSPECTED!

Superintendent:

"Whew! What a leak! Don't believe **we** have any like that."

Pitometer Engineer:

"The chances are, you **do** have them. Our surveys have brought such leaks as these to light in practically every city."

Superintendent:

"Well, everything seems to be all right with us."

Pitometer Engineer:

"Why not make **sure** 'everything is all right'? One way to make sure is to compare your daily consumption per capita with that of other cities. If your figure is high, I advise investigating further. Or compare the number of gallons delivered daily into the mains with the number actually used, as shown by your meters. Perhaps this will disclose a distressing margin of unused or unaccounted-for water. The next step would be to call in The Pitometer Company for a Water Waste Survey."

Superintendent:

"That would be too expensive for us, I fear."

Pitometer Engineer:

"Not half so expensive as letting these leaks go! I can send you booklets telling of water waste surveys we have conducted, that have saved cities thousands of dollars over and above the cost of the survey."

Superintendent:

"Well, I believe I'll check up on the figures, just to be on the safe side. You'd better send along those booklets, too, and I'll look them over."

The **PITOMETER COMPANY**,

Water Distribution Engineers

52 CHURCH ST., NEW YORK CITY

THE X-RAY FOR PUBLIC WATER SYSTEMS

Type of Eddy Hydrant Popularly Used.

More Than Sixty Years of Experience Goes Into All

EDDY
Hydrants and Valves

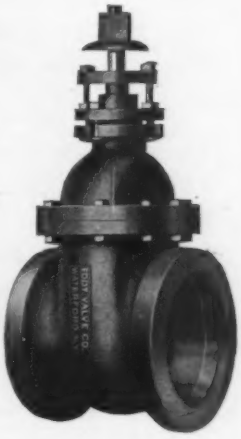
BUILT TO MEET EVERY EXACTING REQUIREMENT OF WATER WORKS SERVICE

Practical water works men instantly recognize the superior features of Eddy products. For instance, with the hydrant:

A damaged valve can be replaced in a few minutes—
Water hammer is avoided by the valve closing against the pressure and the use of the cut-off under the valve, which gradually closes it—
Stems cannot be bent in closing the hydrant—
Nothing can lodge on the valve seat to prevent closing of the valve—
The drip rod can be removed without interfering with the hydrant in any manner—
The position of the stem of the hydrant indicates accurately the position of the valve—
Whatever can pass the valve opening will pass the standpipe—
No frost case is necessary—
All of these points are explained thoroughly in our catalog, which will pay you to study.

The Eddy Valve, Too

Has its distinctive and individual features. The double disk gates are free to adjust themselves in different positions every time the valve is closed, thereby keeping smooth and tight faces. And two bronze hooks on the ball loosely engage with the gates to prevent them from spreading at the top.
The center bearing gates are forced to their seats with equal pressure at all points.
There is a good deal more worth knowing about Eddy Valves.
Further details will be sent for the asking.



Other Eddy Products

The Eddy line of water works products also includes horizontal and vertical check valves, foot valves, hydraulically operated valves, indicator posts, etc.
All goods made by the Eddy Valve Company are manufactured exclusively at Waterford, New York.

JAMES B. CLOW & SONS, CHICAGO
MIDDLE WEST REPRESENTATIVES
OF
EDDY VALVE CO. *FOR THIRTY-FIVE YEARS*

Winning the New-

Each passing year shows a steady increase in the number of communities using Badger Meters.

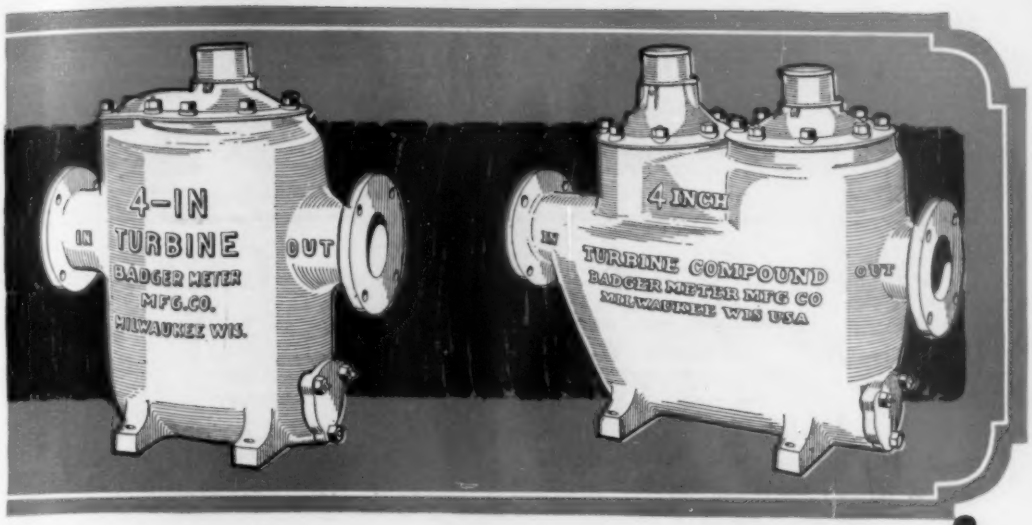
And each passing year finds Badger Meters giving service in an ever-widening territory.

This steady growth is a source of real satisfaction to us. It proves conclusively that Badger has the confidence of the water-works industry—that Badger is being thoroughly tested through daily use—that it renders dependable service—that, above all, Badger Engineering is *Right*.

Badger Meters are designed to perform a definite service—to do it *faithfully, dependably*, and at a *low maintenance cost*. The growth of this company in the past few years is the best proof we have of the worth of our product—the worth of our manufacturing and sales policies. Our guarantee is broad and is your assurance that you are dealing with a house that stands 100% behind its product.

If your lines are not Badger-equipped, let us talk over your requirements with you. It will not obligate you in the least.

BADGER *Water* METERS



Holding the Old!

The meters shown above are leaders in the Badger line. From the 5/8 in. Frost-Proof and Southern Type Models, up through the various sizes, to the Turbine and Turbine Compound, there is a Badger Meter that will economically and dependably serve you.

Badger Disc Meters are made in sizes ranging from 5/8 in. to 4 in. inclusive. Meters equipped with the Frost-Proof feature come in sizes ranging from 5/8 in. to 1 1/4 in. inclusive. Badger Turbine and Turbine Compound Meters are built in sizes from 2 in. to 6 in. inclusive. We will be glad to send you further illustrated bulletins descriptive of the entire Badger line, upon word from you.

GREETINGS
A. W. W. A.

To everyone attending the Annual Convention of the American Water Works Association at Chicago, June 6th to 11th, we extend heartiest greetings. May your stay in the metropolis of the Middle West prove both pleasant and profitable. We urge you to make the Badger Booth your headquarters during the Convention. We also extend a cordial invitation to you to visit our plant at Milwaukee. We are only two hours away — a beautiful ride along the Lake Michigan shore.

BADGER METER MFG. CO.

Milwaukee **Wisconsin**

Branch Offices:

111 W. Washington St., Chicago, Ill.
414 Interstate Bldg., Kansas City, Mo.
52 Vanderbilt Ave., N. Y. City
3136 Arcade Bldg., Seattle, Wash.
Southern Ohio Bank Bldg., Cincinnati, Ohio

BADGER *Water* METERS

TRADE "LEADITE" MARK

Registered U. S. Patent Office

---gives good results *in Chicago*

When you attend the Convention of the American Water Works Association, at Chicago, you will be visiting another Convention City where Leadite has proven successful.

Read This: Extracts from The Annual Report of the City Engineer, City of Chicago to the Commissioner of Public Works, 1924:

"LEADITE USED IN PIPE JOINTS"

"1867 feet of 12 inch pipe were laid. The joints were made with Leadite at a total labor cost of 30 cents per foot which is about ½ of the cost where lead joints are made. There is a further saving in the cost of the material used—Leadite being cheaper per joint than lead. The pipe was tested to a pressure of 125 pounds per square inch before the ditch was backfilled. A test made two weeks later showed no leakage indicating that the Leadite joints had completely tightened up."

Every water works man abreast of the times knows about LEADITE. LEADITE is an interesting and familiar topic at water works conventions and wherever water works men congregate.

The up-to-date water works man specifies and uses LEADITE.

LEADITE saves at least 75%.

LEADITE is the pioneer self-caulking material for c. i. pipe.

Laying 12 inch c. i. bell and spigot water main in Chicago with Leadite Joints.

Be Sure It Is LEADITE and Accept No Imitation

THE LEADITE COMPANY, Inc.

Land Title Building, Philadelphia, Pa., U. S. A.

NO CAULKING

A New Publication on Pool Operation and Construction

Send for It

THIS 16-page bulletin tells how the seven municipal pools of Los Angeles are operated—how they are constructed—and how they are saving 4,500,000 gallons of water a week with Graver Refiltering Systems.

It is free for the asking and no doubt will give you considerable information. Send the coupon for your copy.

GRAVER *Founded 1857* *Corporation*

670 Tod Avenue **East Chicago, Indiana**

Mail This Coupon

Graver Corporation, 670 Tod Ave., East Chicago, Indiana.
Please send copy of "How Los Angeles Protects Her Bathers" to

Name .....

Address .....City and State .....

We have a pool with / without filtering equipment.

We have a pool under construction approximately ..... ft. by .....

average depth ..... ft. holding .....gallons

The Portable GEOPHONE

OFFICE OF
TOWN CLERK AND TREASURER
WINDSOR N. S.

March 9, 1926. 192

The Empire Electric & Water Co.,
452 Lexington Avenue,
New York City, N. Y.

Dear Sirs:

We wish to place an order for one Geophone. We may say that a few days ago a leak occured on one of our large mains, and we borrowed the instrument owned by the City of Halifax.

We found the leak, a blown out joint, very quickly, about sixty feet away from [illegible] water appeared on the ground. It certainly saved us many hours work, as the ground was frozen to a depth of four feet.

Yours very truly,
[signature]
Town Manager

Saved many hours of needless excavation in frozen ground

By using the Geophone you can save thousands of dollars in needless excavation for the location of both large and small leaks in your water mains and services. The Geophone is so well built that it is possible to detect the smallest leak with great accuracy and speed. Hundreds of water departments are using them constantly and consider them invaluable equipment in the economical operation of the department.

Drop us a postcard and we will send you descriptive literature and letters describing the work of the Geophone.

EMPIRE ELECTRIC & WATER CO., Inc.

DISTRIBUTORS

452 LEXINGTON AVENUE, NEW YORK

A COOK Installation Means Peace of Mind for

Tubular Well Supplies—

The COOK Patent Brass Tube Well Strainer

Working Barrels (Deep-Well Cylinders), Single- and Double-Acting

Deep-Well Foot Valves

Pump Rods, Wood ("Sucker") and Iron

Etc., etc., etc.

"We have about 15 A. D. COOK brass screens in use of 6 and 8 inch size and various lengths. Some of them have been in position for approximately 30 years and are still yielding apparently as much water as they ever did. We have had no trouble at all with COOK screens."

Name upon request

Bulletin 30F — The COOK Patent Brass Tube Well Strainer

10 20 30 40 50 YEARS

Pumps—

Single-Stroke, Deep-Well Pumps for Steam, Belt or Motor Drive

Two-Stroke, Deep-Well Pumps for Belt or Motor Drive

COOK TYPE PH, OVERLAPPING TWO-STROKE, SELF-OILING, DEEP-WELL PUMP

"Frankly nothing more could be expected of any piece of machinery. We have hardly looked at it, only changing the oil every 60 days and it has delivered water just like it did the first day it was installed."

Name upon request

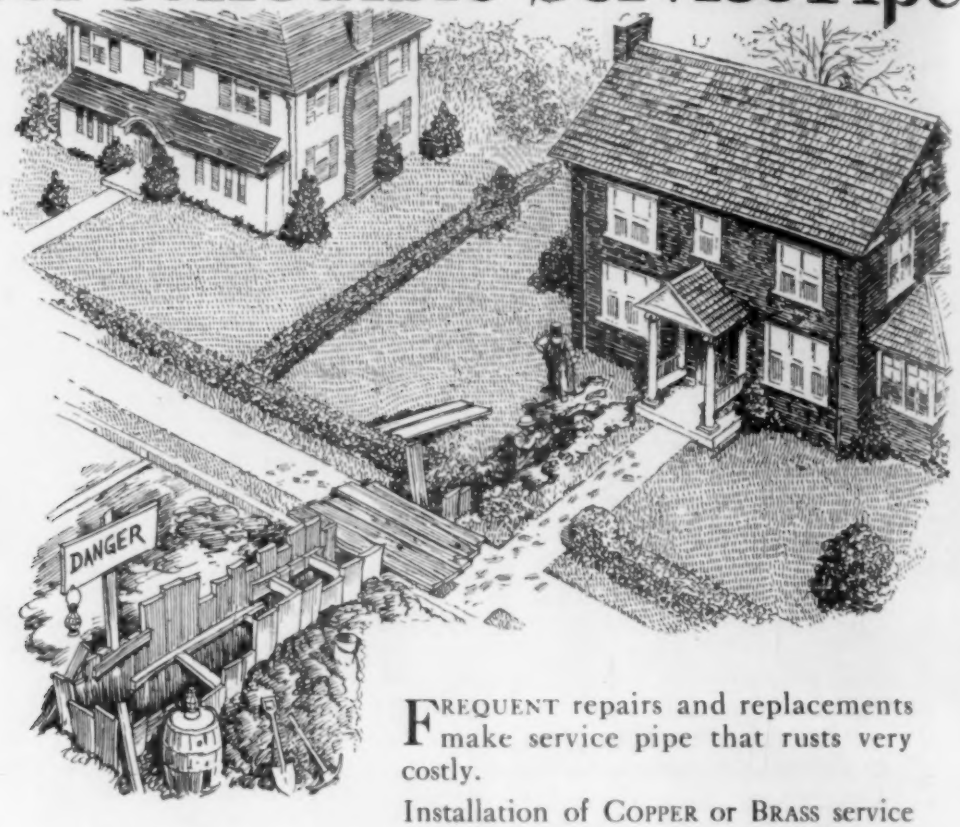
Capacities up to 500 Gallons per Minute. Built in 3 H.P., 5 H.P., 7½ H.P., 10 H.P., 15 H.P., 20 H.P., and 30 H.P. Sizes.

Bulletin 35A — The COOK Type PH Deep-Well Pump

A. D. COOK, Inc.

LAWRENCEBURG, INDIANA

There's More Than One Cost For Corrodible Service Pipe!



Let us advise you on your service pipe problems.

FREQUENT repairs and replacements make service pipe that rusts very costly.

Installation of COPPER or BRASS service pipe eliminates permanently the expense and annoyance of torn-up lawns, sidewalks and streets.

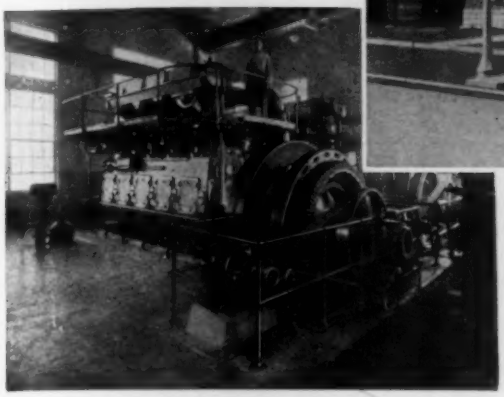
COPPER and BRASS give permanent good service because they never rust. No repairs, no replacements. The first cost is the last.

COPPER & BRASS
RESEARCH ASSOCIATION
25 Broadway, New York

METALS THAT NEVER RUST—COPPER, BRASS AND BRONZE

Do you mention THE AMERICAN CITY when writing? Please do.

With Diesel Power the plant can be put on Main Street ---*no one will object*



INEXPENSIVE architectural touches on the building and simple surrounding landscape can make a Diesel plant one of the show places of the city, because it is clean inside and out and easily kept attractive. There are no unsightly coal and ash piles, no messes on the floor and no soot, coal or ash dust in the air and on the walls. There is no smoke nor smell to pollute the surrounding atmosphere, and no racket from coal and ash handling. By means of the exhaust silencer, operation can hardly be heard across the street in **dead quiet** surroundings, and in daily traffic not at all.

This freedom from annoyance to neighbors permits the lighting, power or pumping plant to be in that central location from which transmission and pipe lines are served easiest and at lowest cost, and from which outside emergency repairs can be made in the quickest time.

—But the real reason for installing Diesel power is the very low fuel cost and maintenance expense, which makes generating or pumping costs per kilowatt-hour or per horsepower-hour usually much smaller than those in small and medium-size steam-electric and steam plants.

If you contemplate a new plant, additional power or remodeling to overcome the excessive costs of old or inefficient steam equipment, let our Engineers tell you more about Diesel possibilities.

McIntosh & Seymour Corporation

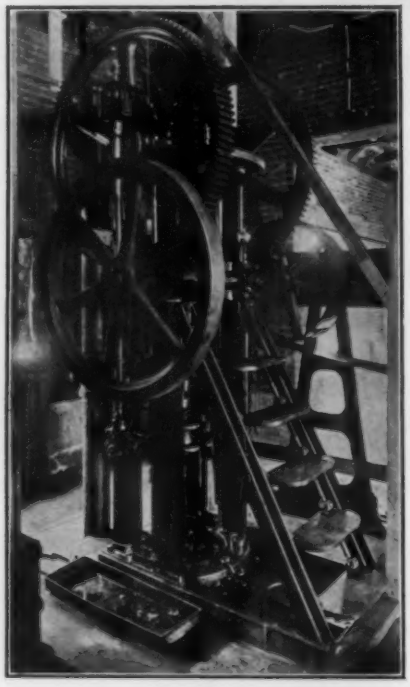
Main Offices and Works: AUBURN, NEW YORK

New York City
Jacksonville, Fla.
Kansas City, Mo.
Houston, Tex.
San Francisco

McINTOSH & SEYMOUR DIESEL ENGINES

TRADE MARK
DOWNIE
REGISTERED U. S. PATENT OFFICE

Newtown, Pa., Has Used Downie Pumps Since 1888



This pump installed in 1892—still in daily use—has run an average of six to eight hours a day, six days a week, since installed.

Mr. L. R. Kenderdine, Superintendent, says,

"Best pump I know of,"
"Repairs simply nothing."

This pump operates at 38 strokes per minute—114 feet plunger travel per minute, 7¾ inch working barrel, pumping against a total head of 175 feet.

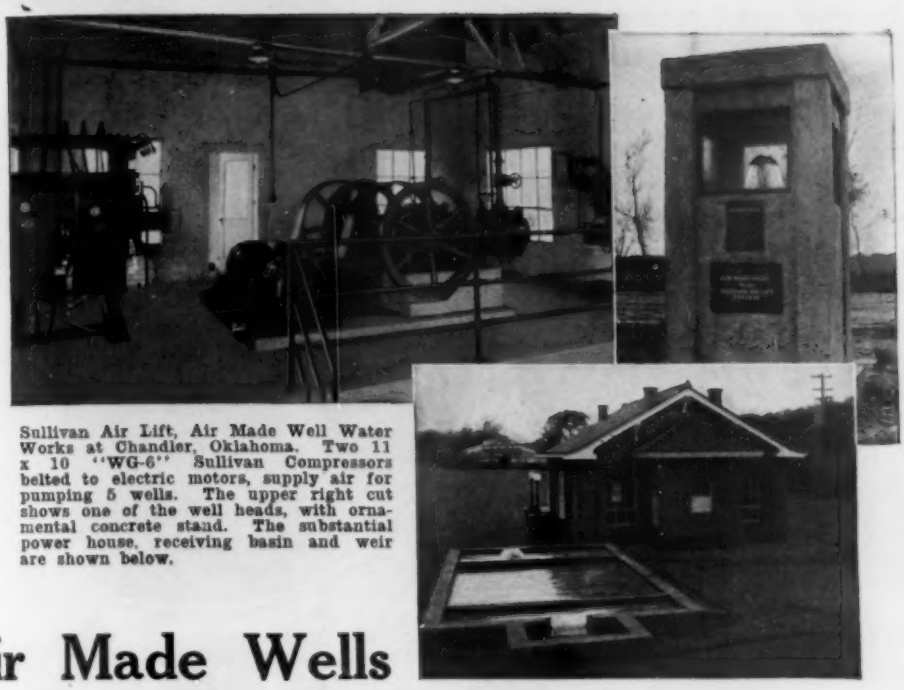
Newtown's complete Downie equipment includes first pump installed in 1888, second in 1892, third in 1923 and fourth in 1925.

LET US HELP YOU

SEND FOR CATALOG

KEYSTONE DRILLER Co

170 BROADWAY, N.Y.C. JOPLIN, MISSOURI
BEAVER FALLS PENNSYLVANIA
MONADNOCK BLOCK CHICAGO, ILLINOIS



Sullivan Air Lift, Air Made Well Water Works at Chandler, Oklahoma. Two 11 x 10 "WG-6" Sullivan Compressors belted to electric motors, supply air for pumping 5 wells. The upper right cut shows one of the well heads, with ornamental concrete stand. The substantial power house, receiving basin and weir are shown below.

Air Made Wells Solve Chandler's Water Problem

Wells dug in the water sands at Chandler, Oklahoma, went dry. Seventy-one drilled wells fell off to less than 5 gallons per minute each. Two consulting engineers said, "You cannot secure a dependable water supply from your shallow wells." Then a single Air Made Well and the Sullivan Air Lift System produced more water than 40 of the other wells —and the water flow from this well is still increasing.

Chandler, like many other cities, has an abundant supply of water in beds of fine sand not far below the surface. But until Air Made Wells were put in, the city was unable to utilize the supply successfully. Sand packed around the brick-lined dug wells and entirely cut off the water. It choked the screens of the drilled wells, reducing the flow so that more and more wells had to be drilled. Something had to be done. The Mayor of Chandler had seen Air Made Wells and Sullivan Air Lift solve a similar problem at Tonkawa, and he investigated.

A test well pumped by the Sullivan Air Lift System was installed, and within one week it was supplying 56 gallons per minute. In 90 days it was furnishing 126 g.p.m. and the water flow is still increasing. Chandler has put in four more Air Made Wells and now has an abundant, reliable supply of water.

The special Air Made Well process and Sullivan Air Lift pump out the sand collecting around the footpiece and replace it with coarse gravel. The collecting basin grows larger and larger, and more and more water flows into the well.

You, too, can make your shallow source of water dependable. You, too, can secure the economies of a smaller pumping plant, and smaller power cost for pumping. Find out about Air Made, Air Lift Wells.

Use the Coupon

Send me free 48-page Handbook describing Sullivan Air Lift, and Air Made Wells.

Name .....

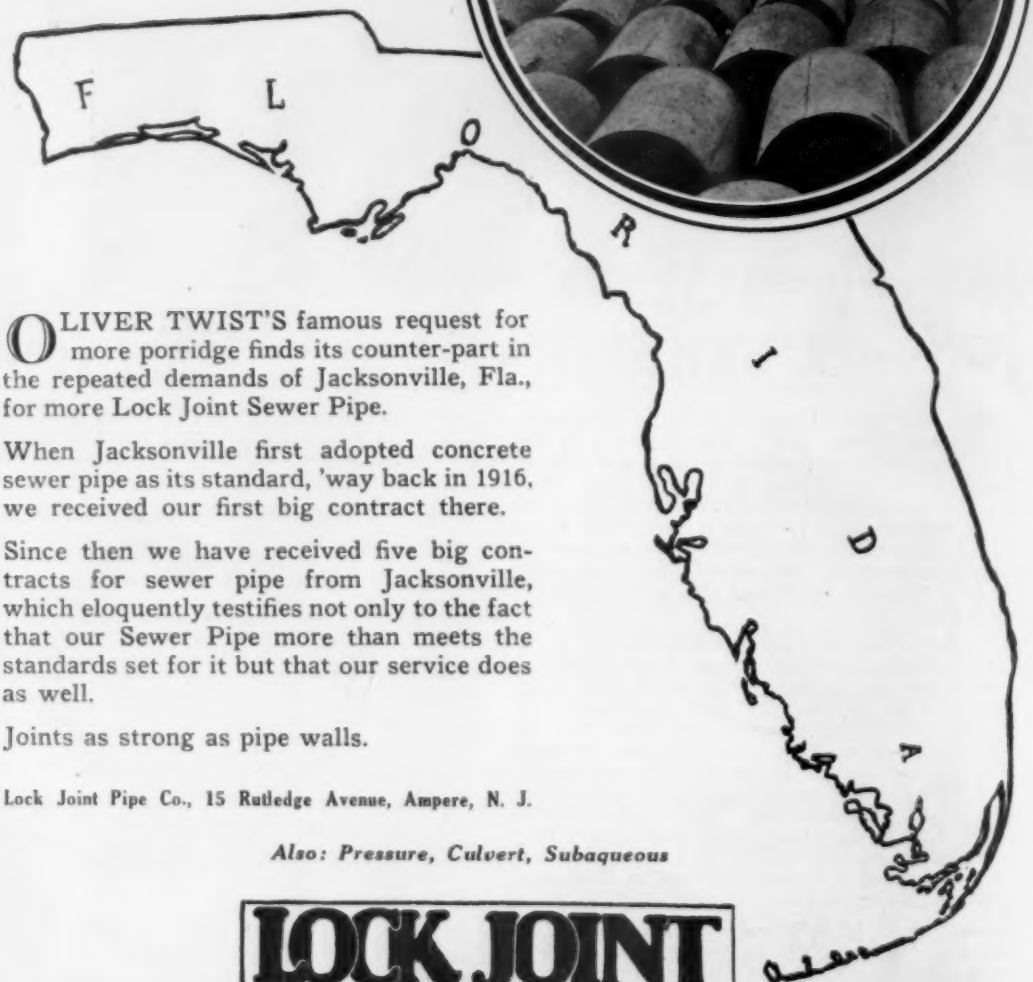
Addres .....

Position .....

SULLIVAN MACHINERY COMPANY

125 SOUTH MICHIGAN AVENUE **CHICAGO, ILLINOIS, U. S. A.**

Jacksonville, Fla. Comes Back for More!



OLIVER TWIST'S famous request for more porridge finds its counter-part in the repeated demands of Jacksonville, Fla., for more Lock Joint Sewer Pipe.

When Jacksonville first adopted concrete sewer pipe as its standard, 'way back in 1916, we received our first big contract there.

Since then we have received five big contracts for sewer pipe from Jacksonville, which eloquently testifies not only to the fact that our Sewer Pipe more than meets the standards set for it but that our service does as well.

Joints as strong as pipe walls.

Lock Joint Pipe Co., 15 Rutledge Avenue, Ampere, N. J.

Also: Pressure, Culvert, Subaqueous

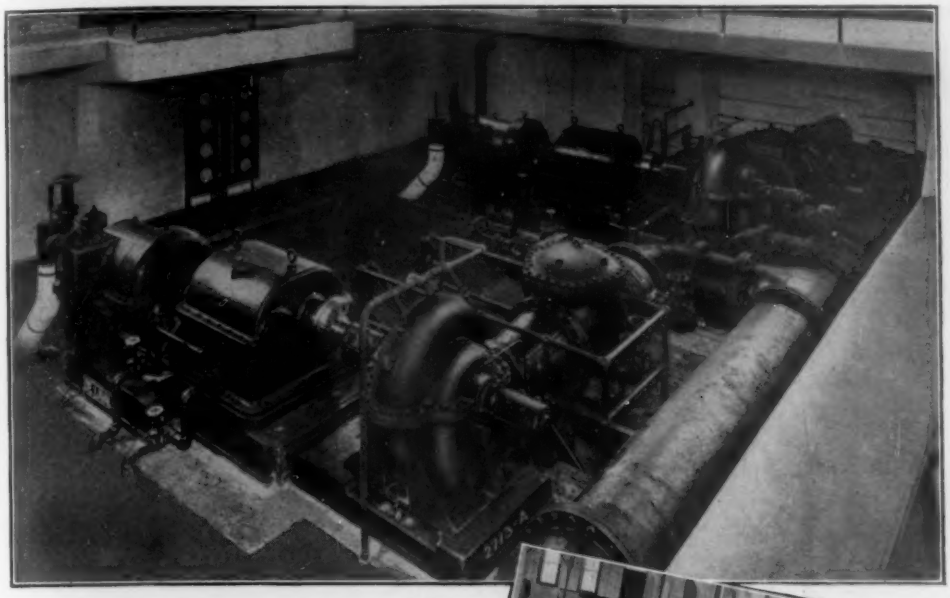
for Sewers

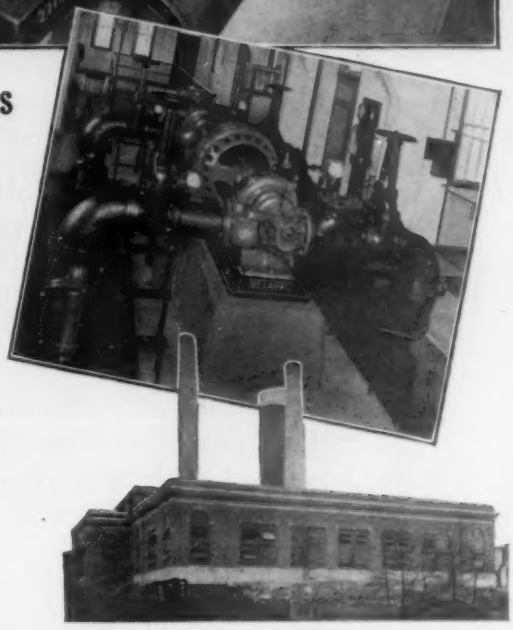
LOCK JOINT
Reinforced
Concrete Pipe

for Sewers

LJ LJ LJ LJ LJ LJ LJ LJ

The offices of THE AMERICAN CITY, 443 Fourth Ave., N. Y., are headquarters for information on equipment for municipal work. If you want catalogs, prices or names of manufacturers, let us help you.





De Laval Pumps at Houston, Texas

THE City of Houston, Texas, has recently equipped its Central Water Works Pumping Station with two De Laval 15-million-gallon-per-day steam-turbine-driven centrifugal pumps, which pump against 190-ft. head. The Scott Street Booster Station is also equipped with two De Laval single-stage 10-in. motor-driven pumps having a capacity of 3000 gallons per minute each against 174-ft. head at 1800 R.P.M.

High efficiency and complete reliability are indispensable for water-works pumps. The satisfactory service rendered by De Laval pumps is attested by the fact that over 200 American municipalities have installed De Laval pumps delivering a total of over five billion gallons daily, or enough for the average requirements of one-quarter of the population of the United States. A large proportion of these pumps were bought on repeat orders.

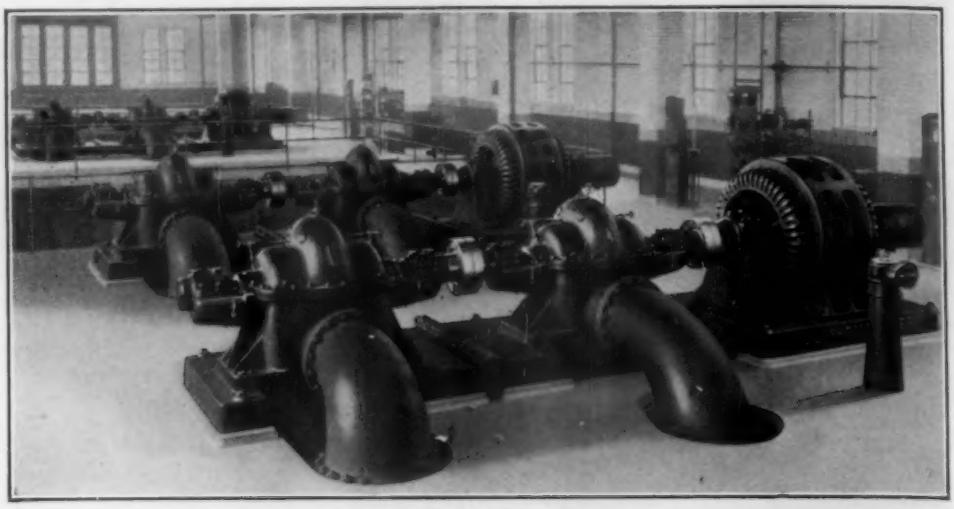
Our engineers will gladly submit information and estimates upon receipt of data relating to your requirements.

De Laval

Steam Turbine Co., Trenton, N.J.

653

LOCAL OFFICES: Atlanta, Boston, Charlotte, Chicago, Cleveland, Denver, Duluth, Havana, Helena, Honolulu, Houston, Indianapolis, Kansas City, Los Angeles, Montreal, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., St. Paul, Salt Lake City, San Francisco, Seattle, Spokane, Toronto, Vancouver.



3-20 M.G.D. 225 ft. head high service Allis-Chalmers motor driven centrifugal pumping units installed in the Fridley pumping station, City of Minneapolis, Minnesota.

A RECORD EFFICIENCY

FOR 20 M.G.D. MOTOR DRIVEN CENTRIFUGAL PUMPING UNITS

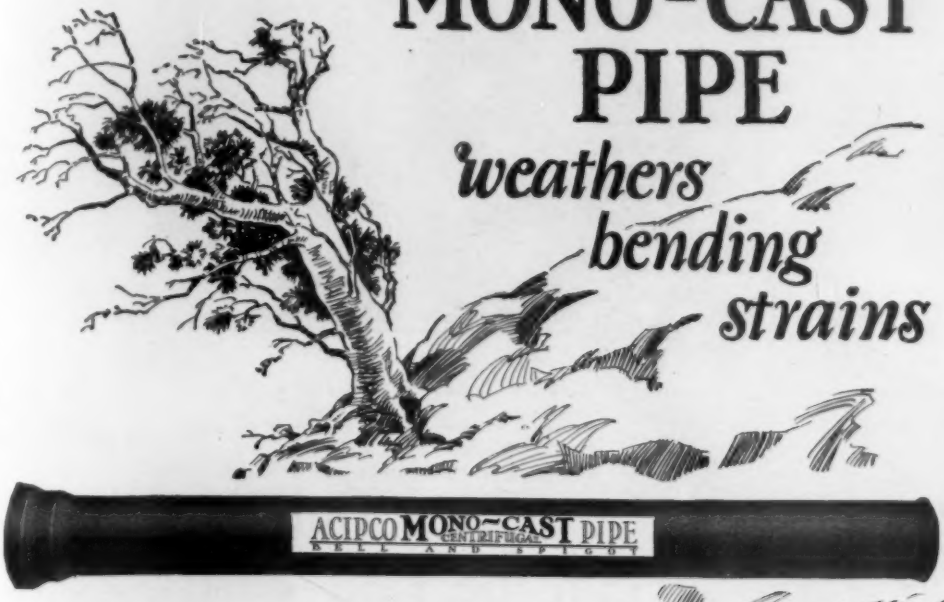
The three Allis-Chalmers Combined Centrifugal Pumping Units, each consisting of a 1,000-H. P. synchronous motor driving two 20″ x 18″ type S. F. Centrifugal Pumps connected in series, furnished for the City of Minneapolis, were recently officially tested. The average combined efficiency obtained was slightly above eighty-four per cent., which so far as we know is a record efficiency for 20 M. G. D. 225-foot head motor driven centrifugal pumping units. It is performance of this kind which demonstrates the economy of Allis-Chalmers Pumping Equipment for municipal and other pumping purposes.

ALLIS-CHALMERS

MILWAUKEE, WIS. U. S. A.

MONO-CAST PIPE

weathers bending strains



FLEXIBILITY and sturdiness have kept this old tree standing for years against strains and stresses that have destroyed its less adaptable fellows.

Flexibilty, sturdiness and adaptability to service conditions enable MONO-CAST PIPE to absorb (and thereby withstand) shocks.

MONO-CAST PIPE is flexible and will therefore deliver service for many years.

This "bendability" is but one of the dozen points that recommend MONO-CAST to the thoughtful buyer.

Costs Less to Buy
Costs Less to Lay

Complete Engineering and Cost Data on Request.

AMERICAN CAST IRON PIPE COMPANY
BIRMINGHAM, ALA.

ACIPCO MONO-CAST CENTRIFUGAL PIPE
BELL AND SPIGOT

PHOTOGRAPH showing part of a cast iron pipe installation at Chicago, Ill.

Standard Bell and Spigot can be laid easily

even under the most unusual conditions

THE cast iron pipe illustrated here passes through an *unlined* rock tunnel.

The strength of Cast Iron Pipe makes this type of installation possible. The accessibility of lines laid in this manner will be quickly appreciated by engineers.

Contractors have long been aware of the ease of standard Cast Iron Pipe installations and can make their bids accordingly.

We maintain a special Service Department for the assistance of contractors and construction engineers. Information about it will be sent to you gladly. Write for details; there is no obligation involved.

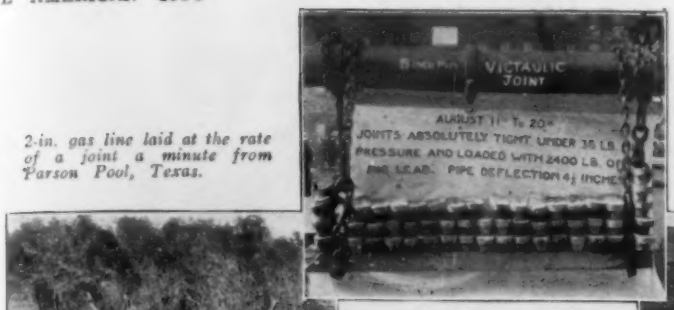
United States Cast Iron Pipe and Foundry Company

SALES OFFICES

Philadelphia, Chicago, Birmingham, Buffalo, Cleveland, New York, San Francisco, Pittsburgh, Dallas, Kansas City, Minneapolis

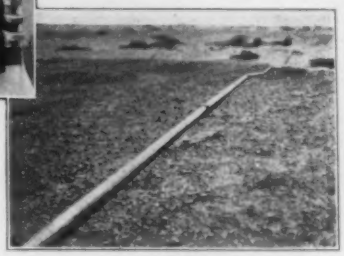
General Offices:
Burlington, New Jersey

Yes—we should like you to mention THE AMERICAN CITY.



2-in. gas line laid at the rate of a joint a minute from Parson Pool, Texas.

6-in. Victaulic — coup'led oil line—laid at the rate of a joint in 2 minutes—in South America.



Part of a nine-day test of Victaulic Couplings by Consolidated Gas Co., N. Y.

The All-Purpose Victaulic Pipe Coupling
Sets New Standards

New standards for speed, ease and economy in pipe line installation — permanent, leak-tight joints fitted by ignorant, unskilled labor at an average speed of less than two minutes per joint — that's what Victaulic Joints mean.

Pipes do not have to be in exact alignment for coupling with Victaulic Couplings—saving much time and expense for handling and excavation when the line is laid over-ground or in a curving trench. A wrench is the only tool needed.

As *straight line couplings* Victaulic Couplings have exceptional strength. As *flexible couplings* they allow approximately five degrees deflection. As *expansion joints* they take up contraction and expansion of the pipe lengths over a wide range of temperature changes.

Victaulic Couplings are leak-tight at all pressures from vacuum to over two tons per square inch. They make shock-absorbing joints which are not affected by vibration, line-sag or shifting, even when under pressure.

Thousands of Victaulic Couplings are in service on crude oil lines, gasoline lines, natural and manufactured gas lines, on mine water and municipal water lines, on sewage systems, ammonia and acid lines, on compressed air lines and on vacuum systems.

They are supplied in all sizes from ¾" up for steel, wrought-iron and cast-iron pipe. They are all-purpose couplings for every joint on the line.

For detailed information and list of uses and users, write for Victaulic Bulletin No. 6.

VICTAULIC COMPANY OF AMERICA

26 Broadway **New York**

The all-purpose pipe coupling

VICTAULIC

REG U S PAT OFF

"For every joint on the line"

Flexible Leaktite Pipe Couplings

For Crude Oil, Gas, Water, Sewage, Compressed Air, etc.

Suppose You *All* Knew

what this Superintendent knows—

Imagine the task of trying to make enough Precalked Joint Pipe for you! Even as it is, we are almost continually engaged in enlarging our plants. Over 14,000,000 feet of McWane Pipe are in service, in every state in the Union.

This Superintendent wrote an inquirer:

> "Our records indicate that we have saved several thousand dollars in materials and labor by the use of Precalked pipe.
>
> ". . . Anyone who acquaints himself with its many advantages will never consider going back to the old-style pipe."

McWane sizes are 1¼ through 8 inches, the lengths standard, and even the Fittings have Precalked Joints. For full details, address

McWANE CAST IRON PIPE CO.
BIRMINGHAM, ALA.

DISTRICT OFFICES:

819 Bankers Trust Bldg. Philadelphia, Pa. — 208 S. LaSalle St. Chicago, Ill. — 1807 Santa Fe Bldg. Dallas, Texas

PACIFIC STATES CAST IRON PIPE CO., Provo, Utah
608 Subway Terminal Building, Los Angeles, Calif.

PRECALKED JOINT PIPE

We specialize in production of every small cast iron pipe.

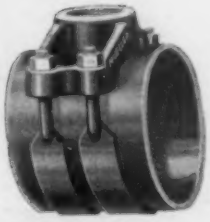
McWane Pipe in 1¼ and 2-inch sizes will last as long as the large mains themselves, can be taken up and relaid when desired, and costs less PER YEAR than any other pipe.

We make more 2-inch cast iron pipe daily than all the other pipe foundries in America combined. The genuine Precalked Joint — obtainable only on McWane pipe—is the reason.

McWANE CAST IRON PIPE precalked

with the Factory-Made Joint

Mueller Drilling Machine, Model "E." Drills holes one-half to one inch—in pipe of all sizes — under pressure. And does it with least wasted effort



Mueller Service Clamp 10494, made of malleable iron, galvanized, provides a dependable, non-leaking connection. Integral-cast, patented lead gasket furnished with every clamp

When the work runs heavy

—you will begin to appreciate the advantage of using this Mueller Drilling Machine.

Model "E" does the work better and in less time. It is simple, sturdy and finely built. It stands the abuse of the hardest job. It comes to you completely equipped and thoroughly tested.

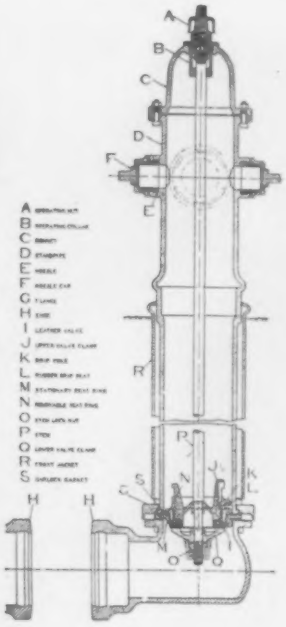
Write us for further information about this and other Mueller products.

MUELLER CO. Established 1857 **Decatur, Illinois**

Branches: New York, San Francisco, Los Angeles
Canadian Factory: MUELLER, Limited, Sarnia

MUELLER

395



MICHIGAN *MODEL "O"* HYDRANT

COMPRESSION TYPE:—The pressure of water in the line assists in closing the main valve and holding it in place. This prevents any loss of water, flooding of streets, or injury to property in case the hydrant standpipe should become broken.

AUTOMATIC DRAIN:—Upon closing the hydrant valve, the drain valve is automatically opened.

NO STUFFING BOX:—This feature in conjunction with the positive automatic drain, means that the hydrant requires little or no attention and consequently can be relied upon to function properly in emergencies.

QUICK OPENING:—Only 4½ to 5 full turns are required to completely open the main valve.

These are but a few of the advantages of the Model "O." —Let us send you our booklet.

MICHIGAN VALVE & FOUNDRY CO.

Established 1852

DETROIT, MICHIGAN

CHEMICALS

QUAKER LIQUID CHLORINE

FOR WATER PURIFICATION
FOR TREATMENT OF SEWAGE

LIQUID CHLORINE

Single Unit Tank Cars **Multi-Unit Tank Cars** (1-ton container) **150-lb. Cylinders**

CHLORIDE OF LIME
SULPHATE OF ALUMINA

Highest Grades, Manufactured by

PENNSYLVANIA SALT MANUFACTURING COMPANY

Executive Offices: Philadelphia

Also representatives at

New York Chicago Pittsburgh St. Louis

Works:

Natrona, Pa. Wyandotte, Mich. Menominee, Mich. Philadelphia
Chlorine Distributing Station, Babbitt, N. J.

Yes—we should like you to mention THE AMERICAN CITY.

...Sealed for the years to come!

Ruberoid Pipe-seal has sufficient strength to permit two or three pipes being lowered together without weakening the joints.

Ruberoid Pipe-seal can be heated conveniently and quickly — it melts at a temperature under 200 degrees F.

P. & B. Rapid Asphalt Paint
Especially prepared for use on all surfaces above or below ground. It is waterproof! Acid-proof! Rustproof! Highly insulating! Ideal for coating or retouching abraded water-pipes, painting cables, foundations, abutments, etc.

SOONER or later further sewer installations will be required to meet the needs of your growing community. Now is the time to investigate Ruberoid Pipe-seal!

Ruberoid Pipe-seal is a proved and an approved compound. It is the specified choice of hundreds of municipal engineers and contractors because they know of the satisfactory service it is giving on many of the largest and most up-to-date sewer systems in this country.

You will want to specify Ruberoid Pipe-seal, because it provides a flexible, watertight joint; impervious to root penetration and inert to the effects of sewer acids and alkalies—a joint permanently sealed for the years to come.

Write to us. Tell us your problems. Our experience of many years is at your service. If you prefer—send the coupon.

The RUBEROID Co.

Chicago **New York** **Boston**

RU-BER-OID

BITUMINOUS PAINTS & JOINTING COMPOUNDS

Amer. City

The RUBEROID Co.
95 Madison Ave., New York City.

Gentlemen: Please send me full information about

☐ Ruberoid Pipe-seal
☐ Ruberoid Bituminous Paints

Name .....

Address .....

Top Cover
Meter Housing

METER & GATE VALVE HOUSINGS

The Reading Meter Housing has the most roomy cover and best locked lid on the market. The cover is large enough to permit the removal of the housed meter quickly and easily.

Reading Gate Valve Housings are non-breakable, non-tilting and noiseless. Made of cast iron of good quality, they are adequate under the heaviest of traffic.

Other Reading specialties—such as meter pit covers, curb boxes, four-in-one pumps, melting furnaces, jointing materials, brass cleaners and scale removers, and miscellaneous water-works tools—are described in our Catalog A.

Gate Valve Housing

Inner Lid
Meter Housing

READING METER REPAIR CO. Inc.
READING, PENNA.

RAPID DRAINAGE PIPE IS THE ANSWER!

Q. What pipe would you choose for draining roadbeds, golf courses and cellars? *Ans.* Rapid Drainage Pipe.

Q. Why? *Ans.* Because it absorbs water quickly throughout its entire surface, and is as near to being indestructible as a drainage pipe can be, standing up well in all kinds of weather. Then, too, look at its concave and convex ends. See how tightly they fit into each other. This means that under any but the most extraordinary conditions the pipe cannot be displaced.

A booklet describing this pipe will be sent on request

WALKER CEMENT PRODUCTS
HERMAN WALKER REALTY CO.
Proprietors
LITTLE FERRY, NEW JERSEY
BALDWIN, L. I., N. Y.
Hempstead, R. F. D. 3

The offices of THE AMERICAN CITY, 443 Fourth Ave., N. Y., are headquarters for information on equipment for municipal work. If you want catalogs, prices or names of manufacturers, let us help you.

Million-gallon elevated tank solved Miami's problem

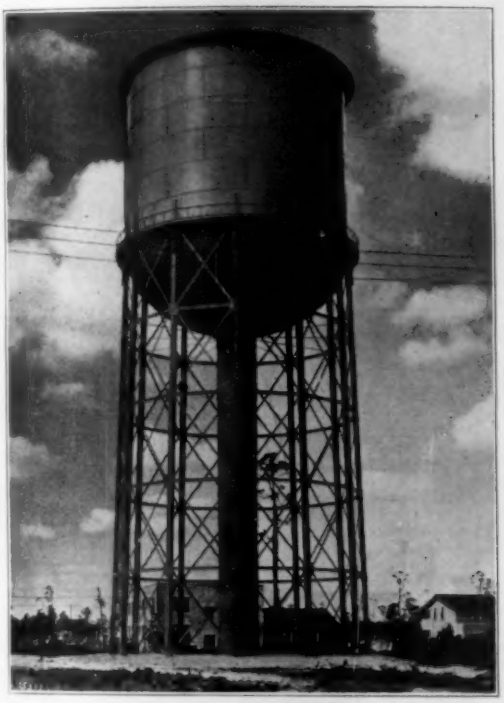
A rush of new population—a greatly increased demand for water—pumps overloaded at peak periods and idling at other times—these are the conditions which were faced at Miami, Florida.

A Horton Tank solved this problem. It is now possible to operate the pumps at a more nearly constant rate, filling the tank during the night and drawing on this storage during the hours of heavy demand. The district directly affected is now served by constant pressure.

A Horton Tank may solve your distribution problem. Ask our nearest sales office for further information or a quotation.

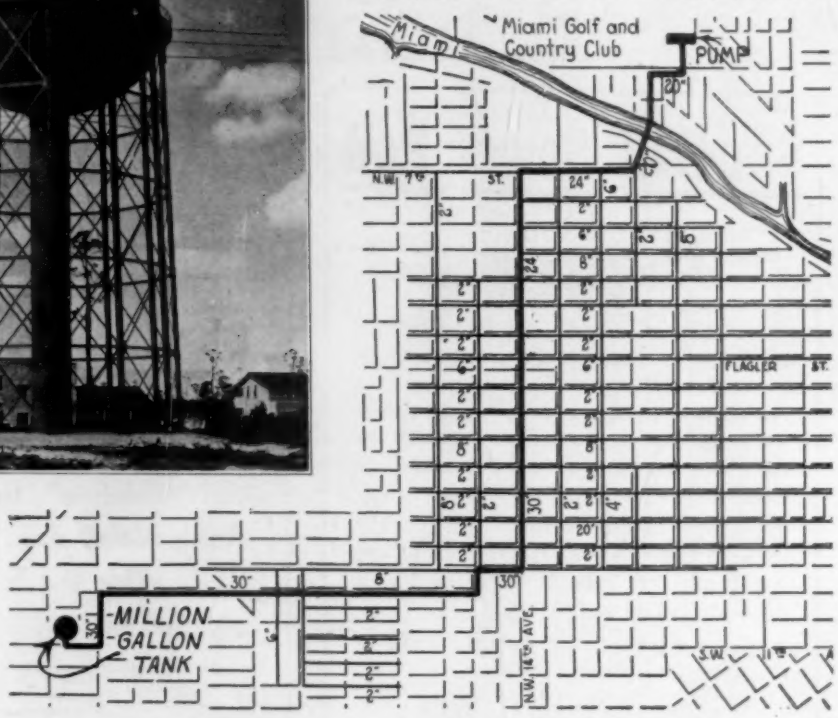
Chicago Bridge & Iron Works

Chicago.....2127 Old Colony Bldg.
New York.....3108 Hudson Terminal Bldg.
Cleveland.....2236 Union Trust Bldg.
Dallas.....1606 Dallas National Bank Bldg.
Atlanta.....1014 Healey Bldg.
San Francisco.....1033 Rialto Bldg.
Havana, Cuba.....Apartado 2507



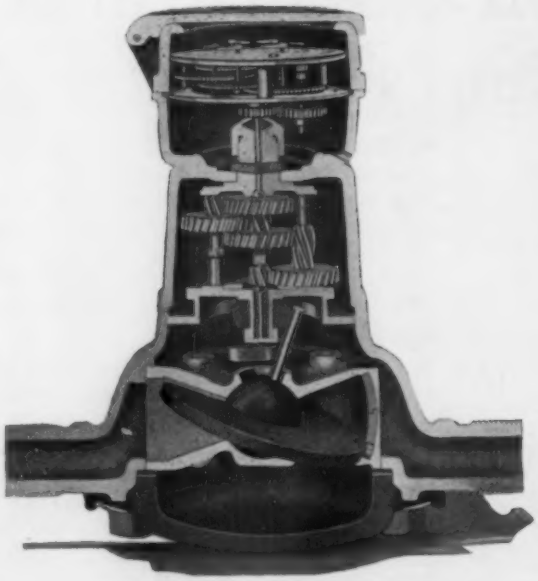
Above: 1,000,000-gallon tank in Miami, Florida.

Right: Shenandoah District distribution system showing location of tank



HORTON TANKS

AC6-GRAY



BREAKABLE BOTTOM,
Guaranteed Against
Damage by Freezing

SPECIALISTS in WATER METERS

Phoenix Meters are made by a company that confines itself *exclusively* to making *Water Meters of Merit.* The meters are of an old and well-proven design, noted for its extreme simplicity. This extreme simplicity, as you know, is of great value to the life of the meter and is particularly appreciated by those responsible for repairs and upkeep. We shall be glad to send you our illustrated booklet, describing the various special features of the *Phoenix Meter.*

PHOENIX METER CO.
Ernest E. Gamon, President
MAIN OFFICE & WORKS
PRINCE BAY NEW YORK

Security Sewer Rod

Security Rods are made from second-growth hickory, with malleable iron couplings swedged or shrunk down very tightly on the curved places at end of sticks. Security couplings *cannot* come off.

Joint and unjoint easily and quickly —light weight—long runs easily made. No slack but lend themselves to all practical bends.

They cannot buckle or uncouple in the duct.

Send for Flyer No. 16

F. Bissell Company
182 Lafayette Street TOLEDO, OHIO

For Dependable Service Installations

"Wakefield" Galvanized Amalgamated Lead Lined Iron Pipe and Fittings

Low Cost—Easily Installed—Permanent

Inquiries respectfully solicited

LEAD LINED IRON PIPE COMPANY
WAKEFIELD, MASS.

For Service and Beauty

THIS Pittsburgh-Des Moines steel tank provides water storage for an outlying district of San Antonio. It holds 1,000,000 gallons, has a hemi-ellipsoidal bottom and a 10 foot diameter all-steel riser. The tank is a special ornamental structure, designed for location in this park.

Pittsburgh-Des Moines elevated steel tanks, standpipes and steel reservoirs provide water storage for hundreds of communities and metropolitan districts throughout the country.

Send for designs and estimates if you plan to build or improve your water system.

Ask for our Municipal Catalog No. 1

SALES OFFICES
Pittsburgh
Des Moines
New York
Atlanta
Chicago
Dallas
Seattle
San Francisco

Pittsburgh-Des Moines Steel Company

603 Professional Bdg.
Pittsburgh, Pa.

905 Tuttle St.
Des Moines, Iowa

PITTSBURGH DES MOINES

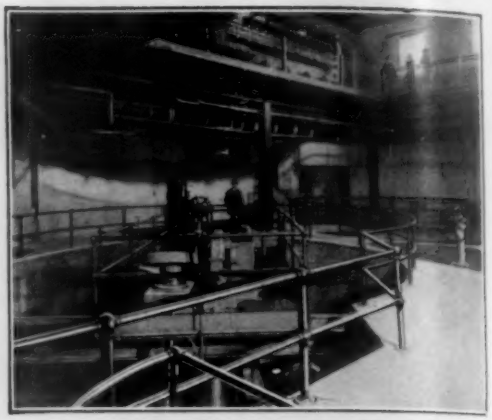
Sewer pipe that is as permanent as the need for sanitation.

CLAY PRODUCTS ASSOCIATION
Chamber of Commerce Building · CHICAGO

• • • •

EASTERN CLAY PRODUCTS ASSOCIATION
Colonial Trust Building · PHILADELPHIA

VITRIFIED Glazed CLAY
Sanitary Sewer Pipe AC6-Gray



Disc Screen Filter Operating Floor of JAMAICA SEWAGE-TREATMENT PLANT, the largest sewage-treatment plant in the largest city of the U. S., Borough of Queens, City of New York. Two 26-ft.-diameter Sanitation curved-slot disc-screen filters.

THE SANITATION CORPORATION

GRAYBAR BUILDING
420 Lexington Ave.

"Every Branch of Sanitation"

USE

JOINTITE

For

Laying Sewer Pipe
(Catalog No. 29)

— As —

The Ordinary Cement Joints

—LEAK,—

Every drop of ground water that gets into the sewer becomes sewage, and has to be pumped, tanked and filtered and the lines enlarged to take this infiltration.

Jointite Can Save This

—WASTE—

Correspondence Solicited

PACIFIC FLUSH-TANK CO.

4241 Ravenswood Ave. CHICAGO, ILL.
149 Broadway NEW YORK

Yes—we should like you to mention THE AMERICAN CITY.

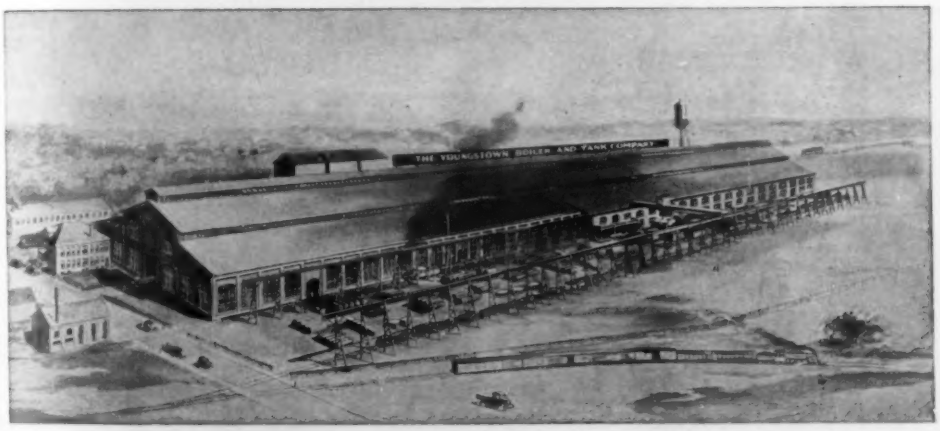
Youngstown TANKS
STANDARDIZED

MADE IN ONE OF AMERICA'S GREATEST TANK FACTORIES

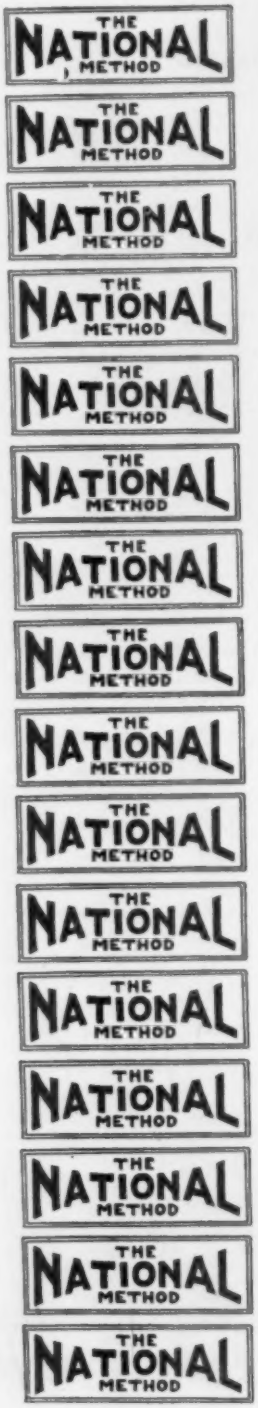
YOUNGSTOWN steel elevated water tanks are manufactured in one of America's greatest factories, devoted exclusively to the fabrication of steel storage. This new home is equipped throughout with the most modern machinery and devices for efficiently making tanks on towers in any type and capacity.

Youngstown elevated tanks are used by municipalities for fire hydrants and domestic and industrial water lines. High pressure is uniform and positive. Or they are equally efficient when installed as "pick-ups" for suburban sections or thickly populated city districts where regular supplies are heavily taxed.

Our engineers will be glad to furnish estimates and plans.



The* YOUNGSTOWN BOILER & TANK *Company
YOUNGSTOWN OHIO



Why have all these cities called upon us more than once to put their mains back to "normalcy" of flow?—

Atchison, Kans.	Louisville, Ky.
Bellevue, Ky.	Merced, Calif.
Birmingham, Ala.	New Castle, Pa.
Boston, Mass.	New Haven, Conn.
Bridgeport, Conn.	Paterson, N. J.
Brooklyn, N. Y.	Philadelphia, Pa.
Buffalo, N. Y.	Pittsburgh, Pa.
Cambridge, Mass.	Rochester, N. Y.
Camden, N. J.	St. Joseph, Mo.
Charleston, S. C.	St. Louis, Mo.
Chicago, Ill.	Salt Lake City, Utah
Cincinnati, Ohio	Shreveport, La.
Covington, Ky.	Springfield, Ill.
Dayton, Ky.	Taft, Calif.
Hartford, Conn.	Tampico, Mexico
Jersey City, N. J.	Trenton, N. J.
Kansas City, Mo.	West Palm Beach, Fla.
Little Rock, Ark.	Wheeling, W. Va.

There's just one reason, of course, and that is that THE NATIONAL METHOD of Water Main Cleaning has given satisfaction.

When you stop to think of the savings in operating cost that one pipe-cleaning job effects, you readily understand why a system that will bring the mains back to 95% of their original capacity, or more, is bound to be endorsed by water-works men, unless the expense of the cleaning job "eats up the profits."

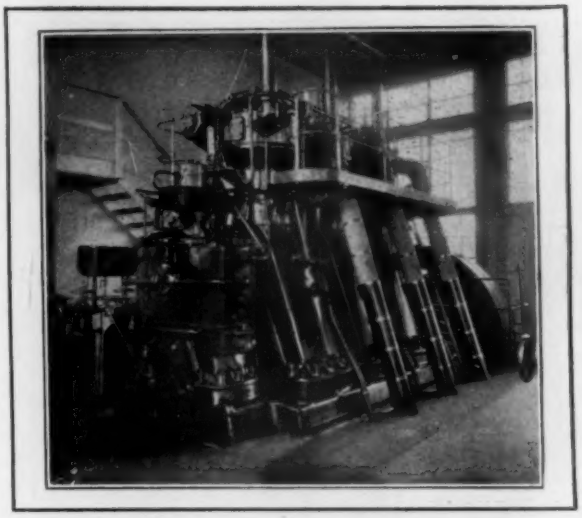
We can prove to you that

THE NATIONAL METHOD

pays profits

Shall we send you cost data? A longer list of repeat contracts? Some specific information about the conditions you are facing? Write us. We shall be glad to offer suggestions without obligation.

The NATIONAL WATER MAIN CLEANING CO.
Hudson Terminal Building **New York**



Saves 81% in Fuel Bill

By replacing their steam plant with modern Fulton-Diesel Equipment, the City of Hawarden, Iowa, saved $18,087.80 in their fuel bill the first year—and produced more power. In fact, the entire cost of operating the Fulton-Diesel plant, including all overhead charges, was only slightly over one-half of the steam plant's coal bill alone.

Let us send you literature describing these dependable, economical engines—not one of which has ever worn out since the first Fulton-Diesels were installed more than 14 years ago.

FULTON IRON WORKS COMPANY, ST. LOUIS, U. S. A.

SUCCESSFUL ENGINE BUILDERS FOR OVER SEVENTY-FIVE YEARS

BRANCH OFFICES:

New York—82 Wall St. Dallas, Texas—Praetorian Bldg. Havana, Cuba—415-416 Manzana de Gomez

FULTON DIESEL

500,000 GALLON TANK
ST. AUGUSTINE, FLORIDA

COLE TANKS

ELEVATED TANKS
STAND PIPES
BOILERS
FLUMES

STEEL PLATE WORK

R.D. COLE MFG. Co
ESTABLISHED 1854
NEWNAN, GEORGIA

Waterous
Dependable

WATEROUS HYDRANTS CAN STRETCH THEIR NECKS

When it becomes necessary to raise the grade line (as it often does in every growing municipality) the Waterous hydrant is instantly adaptable to the situation. The flanged, removable head allows an extension of the desired height to be added and a few minutes sees the situation remedied.

Agents in principal cities

WATEROUS FIRE ENGINE WORKS
INCORPORATED

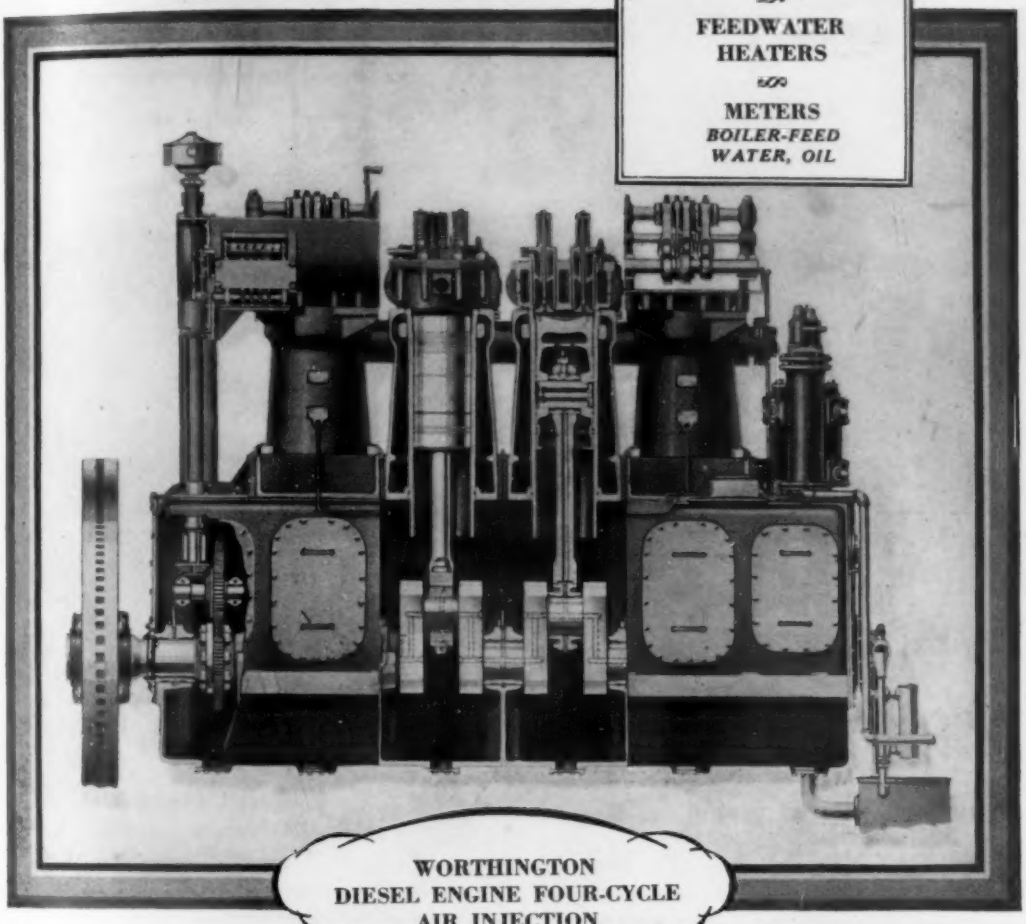
Also Manufacturers of "Waterous" Rotary Pump

Saint Paul, Minnesota

Do you mention THE AMERICAN CITY when writing? Please do.

WORTHINGTON

PUMPS
COMPRESSORS
CONDENSERS
OIL & GAS ENGINES
FEEDWATER HEATERS
METERS
BOILER-FEED WATER, OIL



WORTHINGTON
DIESEL ENGINE FOUR-CYCLE
AIR INJECTION

A heavy duty Diesel Engine

IN that range of sizes or capacities from 300 hp. to 900 hp. a suitable type is the Worthington four-cycle air injection style or class.

Dependability and long life are insured by large cylinder volume per hp., low m. e. p., force-feed lubrication and large bearing areas. Separate cylinders with replaceable cylinder liners keep maintenance charges low. The small number and convenient arrangement of parts give simplicity, reliability and low operating costs.

8235_2

WORTHINGTON PUMP AND MACHINERY CORPORATION
115 BROADWAY, NEW YORK CITY
BRANCH OFFICES IN 24 CITIES

SPARLING MAIN-LINE METERS

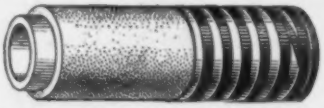
This Sparling Meter, mounted in steel pipe and fitted with 12-inch Register Extension, shows clearly the sturdy simplicity of the device. The register extensions are furnished extra, in any desired length of even feet. At the left is shown the simple, easily read register dial.

R. W. SPARLING

Power and Pumping Machinery
Water Measuring Equipment

945-951
No. Main St.
Los Angeles
Calif.

WRITE US FOR CATALOG



"MICHIGAN" WATER PIPE

ECONOMICAL — DURABLE

IDEAL FOR: Water Works Supply
Power and Manufacturing Plants
Railroad Water Supply

MICHIGAN PIPE CO., Bay City, Mich.

DARLING

FIRE HYDRANTS
AND
GATE VALVES

"the fire chief's choice"

DARLING VALVE & MFG. CO.
WILLIAMSPORT, PA.

McKees Rocks, Pa.
120 tons—24 hours.

Efficient, Odorless Garbage Disposal

THE "United States Standard" incinerator operates at the unusually high temperature of 2,000 degrees F. This insures the complete combustion of all refuse and the elimination of all objectionable odors. No low-temperature destructor will operate in such a satisfactory manner.

Write for information about an incinerator for your town; state your population and present method of garbage disposal.

Send for our Incinerator Booklet No. 1

Pittsburgh-Des Moines Steel Company

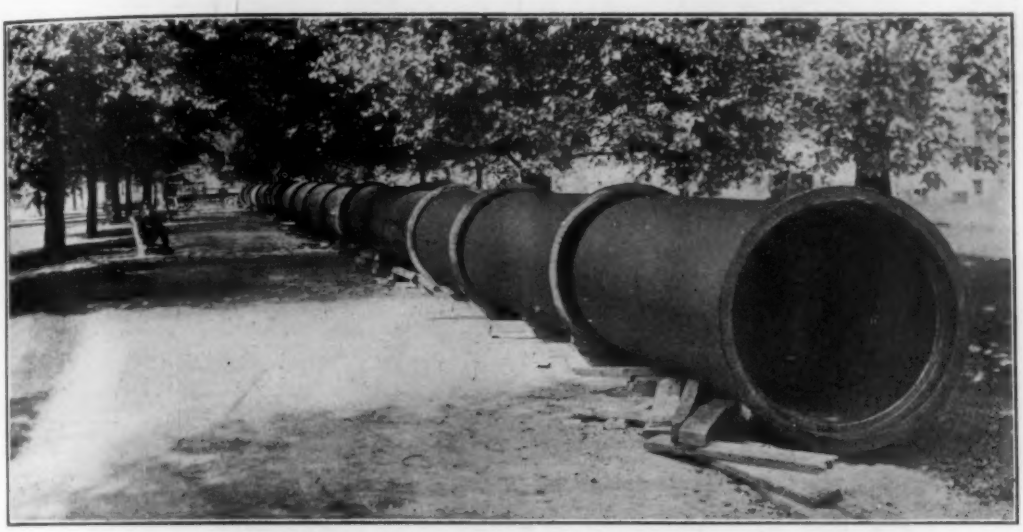
603 Professional Building — Pittsburgh, Pa.

Yes—we should like you to mention THE AMERICAN CITY.

SPECIFY

WARREN CAST IRON PIPE

FOR QUALITY AND SERVICE



48-inch Cast Iron Pipe Line—New Bedford, Mass., Water Works Department.
Pipe for this 9-mile line furnished by Warren Foundry & Pipe Co.

Bell and Spigot
and Flanged Pipe
for Water and Gas
Culverts and
Sewers

High Pressure Pipe
for Fire Service
Flexible Joint Pipe
Specials and
Castings

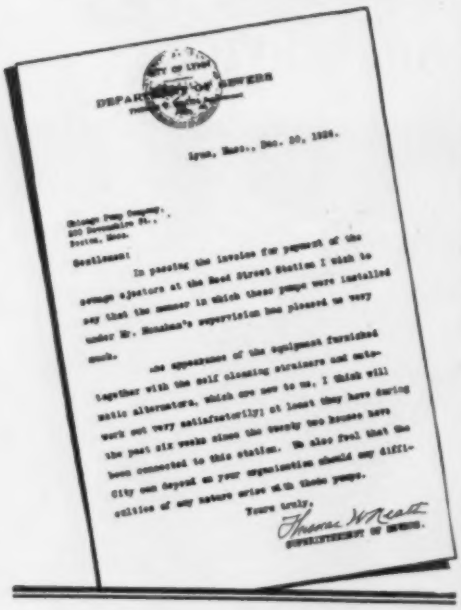
Warren Foundry and Pipe Co.

Established 1856

Sales Offices:
11 Broadway, New York City
201 Devonshire St., Boston, Mass.

Foundries:
Phillipsburg, N. J.

"FLUSH-KLEEN" at Lynn, Mass.



Lynn, Mass., Dec. 20, 1926.

Chicago Pump Company,
Boston, Mass.

Gentlemen:

In passing the invoice for payment of the sewage ejectors at the Reed Street Station I wish to say that the manner in which these pumps were installed under Mr. Monahan's supervision has pleased us very much.

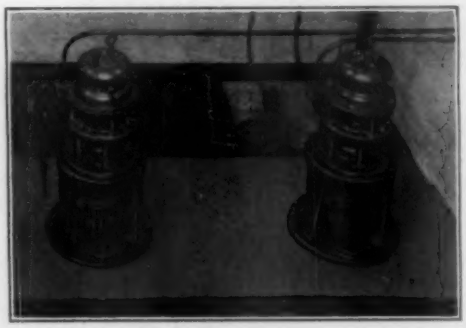
The appearance of the equipment furnished together with the self cleaning strainers and motor alternators, which are new to us, I think will work out very satisfactorily; at least they have during the past six weeks since the twenty two houses here have been connected to this station. We also feel that the City can depend on your organization should any difficulties of any nature arise with these pumps.

Yours truly,

Thomas W. Keating
SUPERINTENDENT OF SEWERS.

"FLUSH-KLEEN" SEWAGE EJECTORS
(Dry Basin Type)
CITY OF LYNN, MASSACHUSETTS

This picture shows interior of Reed Street Pumping Station at Lynn, Mass. The pump outfit consists of a duplex set of "Flush-Kleen" ejectors, complete with pumps, motors, control and self-cleaning "Flush-Kleen" strainers.



CHICAGO PUMP COMPANY
SEWAGE-CONDENSATION-CIRCULATING
BILGE-FIRE-HOUSE-VACUUM

THE EASY PIPE PUSHER

It's easy to **say** that the EASY PIPE PUSHER will save 85% of all your digging when laying pipe under streets, sidewalks, lawns and even buildings—but we want to **prove** it to you. So we have worked out a simple trial rental plan by which the machine proves itself to you, without obligation on your part. Let us tell you about it.

EASY MFG. CO. Lincoln, NEB.

MONTGOMERY & CO., 64 Reade St., N. Y.
Eastern Distributors

Hundreds of cities are today using Easy Pipe Pushers.

WHEN YOU BUY PIPE REMEMBER

CAST IRON PIPE
NATIONAL
IS MADE RIGHT

MADE BY SAND CAST AND DE LAVAUD CENTRIFUGALLY CAST PROCESSES

NATIONAL CAST IRON PIPE Co
BIRMINGHAM, ALABAMA

SALES OFFICES:
Chicago—715 Peoples Gas Bldg.
Kansas City, Mo.—603-04 Land Bank Bldg.
Dallas—1315 Sante Fe Building.
Los Angeles—903 Hellman Bank Bldg.

Do you mention THE AMERICAN CITY when writing? Please do.

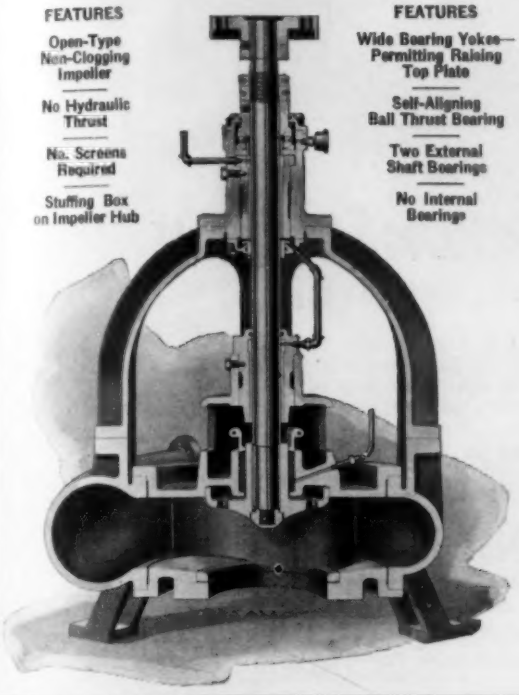
FEATURES

Open-Type Non-Clogging Impeller

No Hydraulic Thrust

No Screens Required

Stuffing Box on Impeller Hub



FEATURES

Wide Bearing Yokes—Permitting Raising Top Plate

Self-Aligning Ball Thrust Bearing

Two External Shaft Bearings

No Internal Bearings

YEOMANS SCREENLESS NON-CLOGGING Sewage Pump

MUNICIPALITIES from New England to California are equipping with Yeomans Non-Clogging Screenless Sewage Pumps wherever crude sewage is to be pumped from low level districts to gravitation sewers or from sewers into sedimentation tanks or for handling effluent or sludge from disposal works.

Solids and foreign matter are readily handled without clogging and no screening devices whatsoever are required.

A few scattered installations:

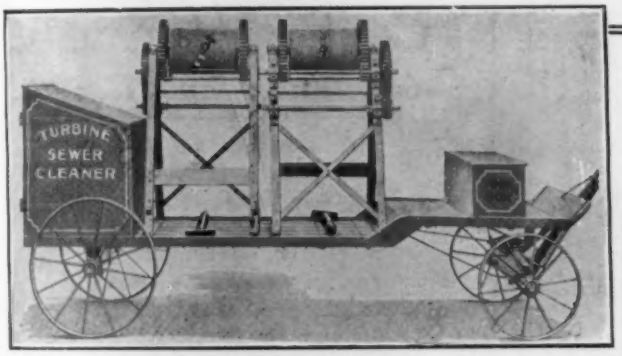
City of Chicago, Ill.
City of Akron, Ohio
City of Blackwell, Okla.
City of Holdredge, Neb.
City of Homestead, Fla.
City of Kewaunee, Wis.
City of Long Beach, Cal.
Village of Mundelein, Ill.
City of St. Petersburg, Fla.
Village of Highland Park, Ill.
City of Delaware, Ohio
City of Gloucester, Mass.
City of Santa Barbara, Cal.
City of Miami, Okla.
City of Milwaukee, Wis.
City of Elizabeth City, N. C.
City of Washington, D. C.

Details, Plans and Specifications sent on request

YEOMANS BROTHERS CO.

Established 1898

1417 Dayton St. Chicago

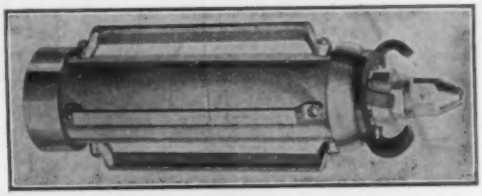


No Stopped Up Sewer is too difficult to yield to this TURBINE SEWER-CLEANING MACHINE

The Turbine will clean and scour a sewer under any and all conditions, even if stopped up to such an extent that a chain, cord or cable could not possibly be pulled through. To our standard machine we have added the Turbine Ferret, shown below, which has been used with great success in cleaning small stoppages, dead end connections, connections from catch basins to main sewers, and house drains.

The TURBINE SEWER-MACHINE CO.

MILWAUKEE, WIS., U. S. A.



ALUMINUM SULPHATE

FILTER ALUM

Lump Filter Alum
for
Solution Feed

Special Ground
for
Dry Feed

QUANTITY output and processes which protect the Standard Purity of this Company's product enable the user of Filter Alum to place his orders with General Chemical Company with implicit confidence as to quality and delivery. And he will find his good judgment confirmed by the majority of purchasers of this important product.

GENERAL CHEMICAL COMPANY
40 RECTOR STREET NEW YORK
Cable Address, Lycurgus, N.Y.
BUFFALO · CHICAGO · CLEVELAND · DENVER · LOS ANGELES
PHILADELPHIA PITTSBURGH · PROVIDENCE SAN FRANCISCO · ST. LOUIS
THE NICHOLS CHEMICAL COMPANY, LIMITED, MONTREAL

CAST IRON PIPE INSPECTION

by

ROBERT W. HUNT COMPANY

Is an Individual Inspection of Each Length of Pipe, and the Witnessing of the Hydrostatic Tests as offered at the Point of Manufacture. This is of paramount importance when buying to American Waterworks' Specification. Write for Booklet.

We Never Sublet Our Work

ROBERT W. HUNT COMPANY
ENGINEERS
2200 Insurance Exchange Bldg.
CHICAGO

Cast Iron Pipe
for Water and Gas

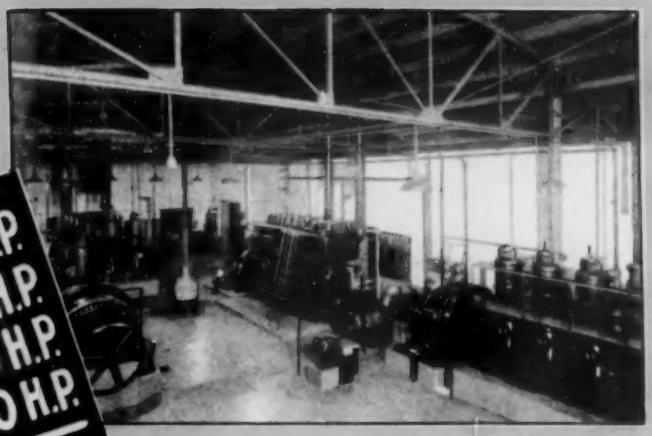
Cast Iron Pipe and Special Castings, Bell and Spigot, Flange, Flexible Joint, Culvert, Milled and Plain End Tubes, Cylinders, Flanged and Bell and Spigot Fittings, High Pressure Fire Service Pipe, Warren Short Body Specials.

Sizes 2- to 60-inch

Pipe manufactured in accordance with standard specifications adopted and approved by water works associations and engineers.

Warren Foundry & Pipe Co.
Formerly
Warren Foundry and Machine Co.
Sales Bowling Green Building, New York City.
Offices: 201 Devonshire Street, Boston, Mass.

 The offices of THE AMERICAN CITY, 443 Fourth Ave., N. Y., are headquarters for information on equipment for municipal work. If you want catalogs, prices or names of manufacturers, let us help you.



1917 - 200 H.P.
1920 - 200 H.P.
1923 - 300 H.P.
1926 - 480 H.P.
TOTAL - 1180 H.P.

General view of the Norton, Kansas, power plant showing the arrangement of 1180 horsepower of F-M Diesel Engines

There is the verdict of Norton, Kansas

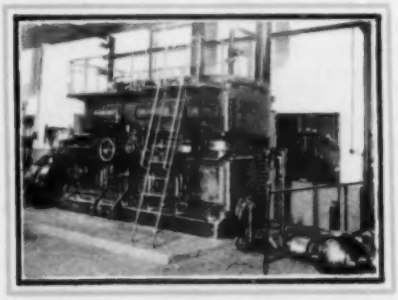
Another clear-cut story of absolute confidence in F-M Diesels—told in repeat orders by the growing city of Norton, Kansas.

The Fairbanks-Morse Diesel came into the Norton municipal light and water plant in 1917. Then came other and larger units as tabulated above. Each time the units have been paid for out of the earnings of the plant—without bond issues. Meantime light and water rates have been reduced.

The last unit purchased by Norton—a 480-hp. F-M Diesel—was ordered before Fairbanks-Morse had ever built an engine of this particular size. Its purchase was based purely on the confidence inspired by years of faithful Fairbanks-Morse performance.

That faith is now rewarded in the smoothly operating engine illustrated opposite. The record of this plant is simply one more vivid illustration of what can be accomplished in *your* town.

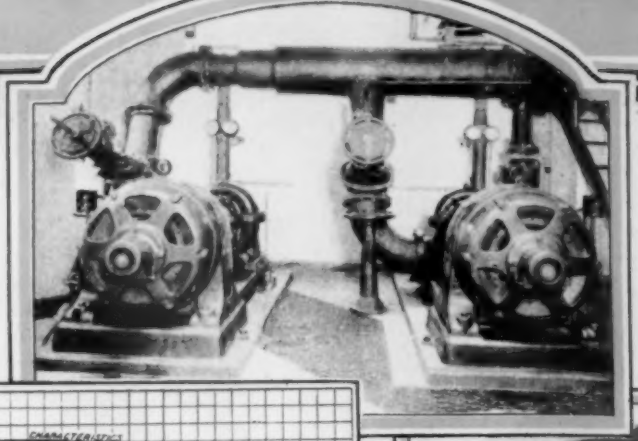
Ask for booklet describing F-M cost-cutting installations in municipally owned plants.



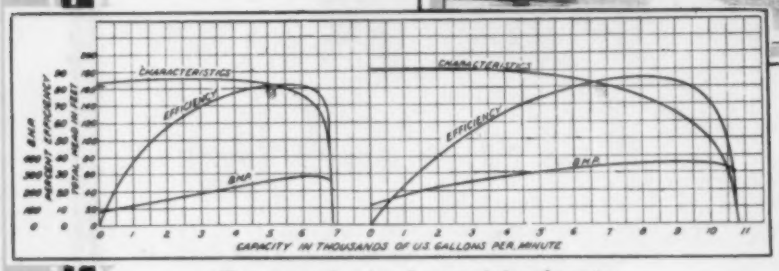
No vibration here. In taking this picture the camera was exposed 15 minutes while the engine was operating. Sharp detail would have been impossible if there had been the least vibration

FAIRBANKS-MORSE

DIESEL ENGINES • PUMPS
MOTORS • SCALES



Interior of Oak Lane Pumping Station showing the two 12-inch F-M Pumps driven by 250-hp. F-M motors. Also exterior of Booster Station.



Test curves showing characteristics of pumps

F-M guaranties exceeded
at the new Oak Lane Booster Station

The curves above show how F-M motor-pump units not only passed the rigid acceptance tests of the Philadelphia Water Bureau, but actually exceeded the guaranteed efficiency by a considerable margin.

Two of the units are duplicates and are represented by the one curve showing a 12-in. pump. These pumps were each guaranteed for 5200 g.p.m. against a 160-ft. head. The one 15-in. pump operates under same condition except that capacity is 7000 g.p.m.

All of these pumps show a flat characteristic curve which is particularly important in booster station work. It means that when pumping directly into the mains the capacity can be varied through a wide range with very little change in pressure. For instance, the curve on the 12-in. pumps shows that the variation from 3800 gallons per minute to 6200 gallons per minute is secured with a pressure variation of only 20 ft. or about 8.7 pounds. With this variation the efficiencies range from 77 per cent to 81.5 per cent.

Another point brought out clearly is the conservative basis of rating. The 12-in. pump is rated at 5200 g.p.m., and although the efficiency guaranteed was 80 per cent, the actual efficiency, as shown by the curve, was 82 per cent. Still more important, however, is the fact that the efficiency curve continues up to the right of the rating point. This shows that the *normal* capacity of the pump is *big enough to handle the job.*

In municipal and privately owned water works, from those supplying small villages up to those protecting the health of great cities, F-M pumps are more than making good—just as in this trim installation at the Oak Lane Booster Station.

FAIRBANKS, MORSE & CO., *Chicago*

28 branches throughout the United States at your service

FAIRBANKS-MORSE

PUMPS · DIESEL ENGINES
MOTORS · SCALES

AOPA90.4

over 4,500,000 made and sold the World over

LAMBERT METERS

In 1890 Mr. John Thomson invented and began the manufacture of the original Lambert Water Meter, of which well over one million have been made and sold by the organization he founded, the Thomson Meter Corporation.

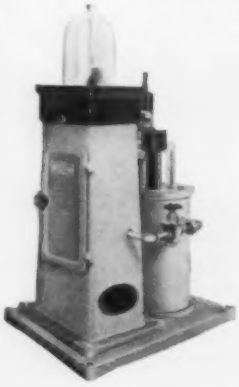
TRIDENT METERS

In 1892 Mr. Thomson withdrew from the Thomson Meter Corporation, founding the Neptune Meter Company, redesigning and improving the Trident Meter, of which over 3½ million have been made and sold.

Of these two famous Meters, over 4,500,000 have been sold. They are known the world over. They embody every noteworthy improvement in meter construction and operation. It is only logical that the two great present companies that created them should at last unite in a single greater organization (the largest water meter manufacturers in the world) joining experience and resources in the production of meters that may truthfully be described as

"The Cash Registers of the Water Works Field"

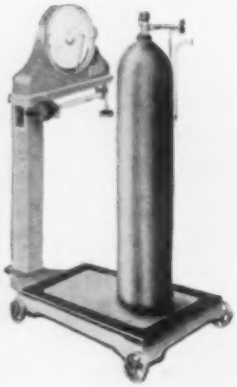
NEPTUNE METER COMPANY
THOMSON METER CORPORATION
50 EAST 42ND STREET, NEW YORK CITY
FACTORY, LONG ISLAND CITY, N.Y.
PIONEERS IN METER PROGRESS



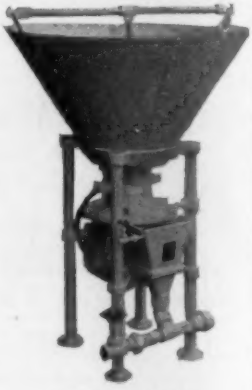
ASV
The W&T Automatic Vacuum Chlorinator. Automatically varies the chlorine flow as the water varies.

WHEN you buy a W&T chlorinator you buy more than a machine to sterilize water—you buy a SERVICE. Nearly a hundred trained engineers—chemists—bacteriologists and technicians constitute the W & T technical staff, and they are always ready to give instant service to our customers.

CHLORO-CLOCK
The W&T Chloro-Clock feeds a prepared sterilizing solution. Particularly applicable to very small supplies.



CHLORO-SCALE
The W&T Chloro-Scale gives a permanent chart record of the chlorine flow.



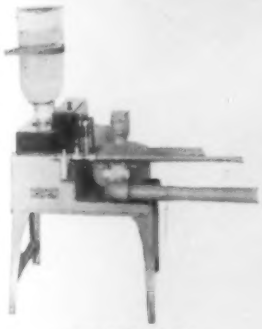
THE W&T DRY CHEMICAL FEEDER
The fastest selling, most satisfactory dry chemical feeder on the market.

"The only safe water is a sterilized water"

WALLACE & TIERNAN
COMPANY, INCORPORATED
Manufacturers of Chlorine Control Apparatus
NEWARK - NEW JERSEY

NEW YORK CHICAGO ENGLEVILLE SAN FRANCISCO MINNEAPOLIS PITTSBURGH DALLAS KANSAS CITY
LOS ANGELES SEATTLE ST. LOUIS BUFFALO HARRISBURGH INDIANAPOLIS DETROIT
WALLACE & TIERNAN, LTD., TORONTO, CANADA WALLACE & TIERNAN, LTD., LONDON, ENGLAND

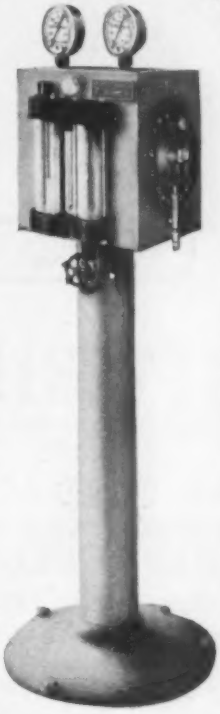
SA7



CHLOROMETER

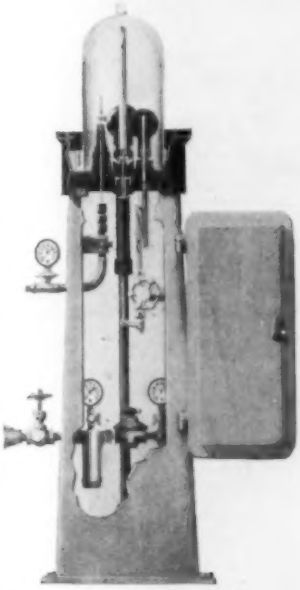
The W & T Chlorometer, automatically applies a prepared sterilizing solution. Intended for the country estate and small private water supplies.

WHETHER it be water sterilization, sewage disinfection, swimming pool sanitation, or deodorization, there is a standard type of apparatus available for the purpose and a trained W & T man ready to install the equipment and guarantee its satisfactory operation.



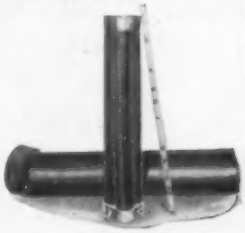
MSP

The newest W & T chlorinator —Type MSP—unequalled for small communities.



MSV

The Peer of all! The famous W&T Vacuum Chlorinator, Type MSV.



OTO

The W & T Ortho-Tolidin Testing Outfit popularized this very important test for residual chlorine—every user of chlorine should have one.

"The only safe water is a sterilized water"

WALLACE & TIERNAN

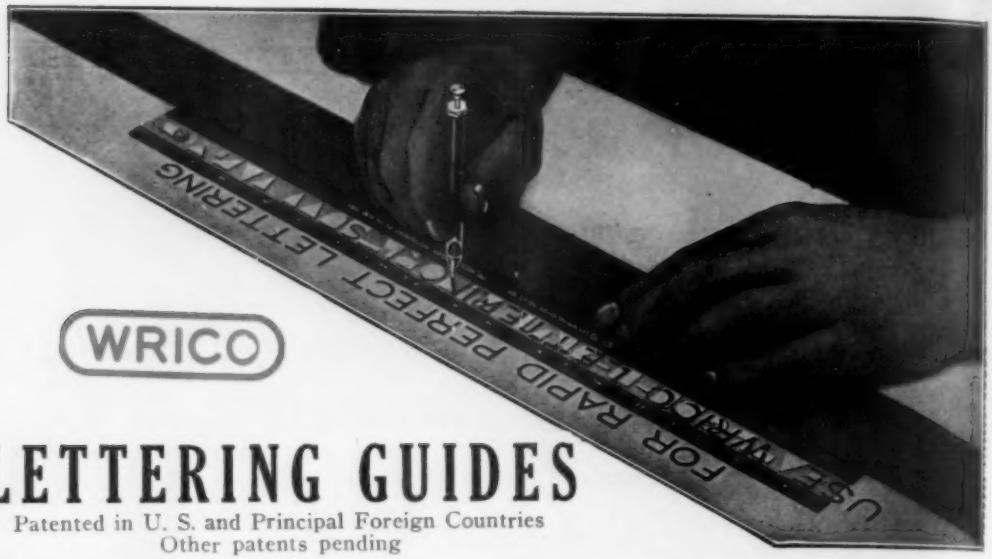
COMPANY, INCORPORATED

Manufacturers of Chlorine Control Apparatus

NEWARK · NEW JERSEY

NEW YORK CHICAGO KNOXVILLE SAN FRANCISCO MINNEAPOLIS PITTSBURGH DALLAS KANSAS CITY
LOS ANGELES SEATTLE ST. LOUIS BUFFALO HARRISBURGH INDIANAPOLIS DETROIT
WALLACE & TIERNAN, LTD., TORONTO, CANADA WALLACE & TIERNAN, LTD., LONDON, ENGLAND

SA7



LETTERING GUIDES

Patented in U. S. and Principal Foreign Countries
Other patents pending

With WRICO Lettering Guides your draftsmen can do PERFECT UNIFORM LETTERING in a fraction of the time required for freehand lettering.

We shall be glad to send you our latest catalog and price list describing all sizes and styles of WRICO Lettering Guides, including Guides for Verticle and Slant Lettering, Upper and Lower case, and Condensed Lettering.

Note: If you already have the 1926 WRICO Catalog, send for supplements No. 1 and No. 2.

Gentlemen, I am interested in rapid, perfect lettering at a fraction of the cost of freehand lettering. Send me your latest catalog and price list, containing a full description of WRICO Lettering Guides, together with complete samples of the work they do.

Name .....

Address .....

.....

.....

City .....

State .....

A. C.

Fill out—
tear out—
mail out
NOW—

Some users of WRICO LETTERING GUIDES

Henry L. Doherty & Co.
J. G. White Engineering Corp.
Thompson-Starrett Co.
Penna. Railroad System
American Steel & Wire Co.
American Bridge Co.
Atlantic Refining Co.
Westinghouse Air Brake Co.
Stone & Webster, Inc.
A. Leschen & Sons Rope Co.
Bethlehem Steel Corp.
United Electric Light & Power Co.
Worthington Pump & Machinery Co.
Link Belt Co.
Newport News Shipbuilding & Dry Dock Co.
American Telephone & Telegraph Co.
New York Transit Commission
Southwestern Portland Cement Co.
Babcock & Wilcox
General Electric Co.
Ingersoll-Rand Co.
John A. Roebling's Sons Co.
Ford Motor Co.
Union Pacific R. R. System
De Laval Steam Turbine Co.
Western Electric Co.
Fairchild Aerial Camera Corp.
Hendey Machine Co.
General American Car Co.
Armstrong Cork Co.
Brown & Sharpe Mfg. Co.
American Road Machinery Co.
Pure Oil Co.
New York Central R. R.

THE WOOD-REGAN INSTRUMENT CO., Inc.
South Orange
New Jersey

Do you mention THE AMERICAN CITY when writing? Please do.

AN ADVERTISEMENT OF
THE AMERICAN TELEPHONE AND
TELEGRAPH COMPANY

THERE are twenty-five Bell Companies, but there is but one Bell System—and but one Bell aim and ideal:

A telephone service for this nation so far as humanly possible free from imperfections, errors and delays, and enabling anyone anywhere at any time to pick up a telephone and talk to anyone else anywhere else in this country, clearly, quickly and at a reasonable cost.

WALTER S. GIFFORD
President

A Good Example—

One community might have paid $355,041 for the job (according to the high bid), but—

National advertising in Engineering News-Record brought 14 bids, the low bid being only $282,477, for the construction of a reinforced concrete and steel viaduct.

ENGINEERING NEWS-RECORD, with a weekly circulation of over 30,000, reaches contractors, manufacturers and dealers everywhere interested in bidding on public works contracts.

Over 2,500 official proposals from towns, cities, counties, and state and government departments have been published each year in Engineering News-Record. These small investments for advertising have saved large sums, in many cases, over the original estimated cost of the work. You, too, can cover the entire field and secure the greatest competition from reliable contractors by publishing your advertisements for bids on public works contracts in the—

"DOMINANT PROPOSAL ADVERTISING MEDIUM"

ENGINEERING NEWS-RECORD

Keen competition and "close figuring" of bidders on work that is widely advertised is sure to bring you the "lowest possible bid" for the work required. Your public buying will be on an efficiency basis, and appropriations for community development will go further.

Advertising rate—40 cents a line per insertion

For used construction and municipal plant equipment, wanted or for sale, consult the Searchlight Section of Engineering News Record with its advertisements of equipment offered by both private owners and dealers everywhere.

ENGINEERING NEWS-RECORD

"The Dominant Proposal Advertising Medium"

Tenth Ave. & 36th St., New York

Annual subscription rate to any part of the world, $4.00. Back numbers available.

HAROLD S. BUTTENHEIM
Editor

THEODORE R. KENDALL
Secretary and Engineering Editor

M. V. FULLER, H. M. OLMSTED
Associate Editors

EDGAR J. BUTTENHEIM
President and Manager

HERBERT K. SAXE
Treasurer

L. P. ANDERSON
Advertising Manager

The American City

Published monthly by
American City Magazine
Corporation
443 Fourth Ave.,
New York

Chicago Office
Tribune Tower

TOM DIX
Vice-President

Vol. XXXVI — INDEX TO CONTENTS, JUNE, 1927 — No. 6

Accident Prevention
Ordinance to Restrain Exhibition Flying.. 782
American Grade-Crossing Record Compared 841
Art Commission, Village 810
Beautification and Americanization, Canton.. 834
Bridges
Privately or Publicly Owned 811
Chambers of Commerce and Mt. Hope Bridge 836
Building, New City and County, Provo, Utah. 833
Calamity Program Outlined by Ordinance.... 839
City and Regional Planning and Zoning
Supreme Court Upholds Zoning, Los Angeles 744
Australia's New Federal Capital Opened.. 769
Is Super-Congestion Inevitable? 800
Land Exploitation as a Hindrance 805
Functioning of County Planning Federation 830
Furthered in Maine, by Rockland 834
1907 to 1927 in City Planning..... 840
Zoning Notes 855
Civic Team Work by the Project Method.... 761
Conventions 865, 867
Finance
The General Fund 845
The Municipal Bond Market 849
Fire Prevention and Control
Menace of Fires and Panic in Theatres.... 806
Winning Methods in Inter-Chamber Contest 809
Standardization of Fire-Hose Couplings... 809
Ambulance and Lighting Truck, Baltimore. 834
Yellow Instead of Red for Fire Plugs.... 836
New Siren Fire Alarm 879
Forestry in Relation to the County Park Idea 782
Government, Municipal
City Manager Plan Wins in Austin..... 832
Efficiency Measured by Munro Criteria.... 832
Health Board Recognized Necessity in County 838
Highways
Abating the Dust Nuisance 772
County Officials' Section, A. R. B. A..... 824
Easy Handling of Excavation for Widening 826
Premolded Joints for Concrete Roads..... 873
Use of Admixtures in Concrete 877
New Joint-Pouring Machine 885
Housing in Large Cities; Cliff Dwellers..... 837
Ice Stations, Municipal, in Omaha 790
Legal Decisions 851
Lighting Contract, Biscayne Boulevard 873
Motor Apparatus for New York City 871
National School for Commercial Executives.. 838
Police
Police and the Causes of Crime..... 797
Sensational Newspapers Help Create Crime 837
Specially Designed Police Patrol..... 877
Light-Weight Bullet-Proof Vest 881
Public Milk Monopoly, Plan for..... 812
Publications 857
Recreation
Current Practice in Dance Hall Regulation 783
Obstacles to Recreation System 813
Asphalt Tennis Courts for Public Parks.. 827
Playing Places in 790 American Cities.... 838
Sewers
Screening Sewage to Protect Beaches.... 774
Maintenance and Catch-Basin Cleaning... 762
Sewage Treatment and Water Purification. 765
Street Cleaning and Snow Removal
Type of Pavement in Relation to Cleaning. 745
Boston's Fleet of Snow-Fighting Trucks.. 768
Cleaning Streets with Tractors 875
Two-Motor System in Street Flushing.... 881
Swimming Pools
Fleishhacker Pool, San Francisco 748
Public Cooperation in Pool Sanitation.... 820
Number in 968 Cities 820
Traffic and Transportation
Pedestrian—Regulations, and Enforcement 798
New York City of the Near Future..... 801
The Henckenway—An Urban Microcosm.. 802
Dr. Harriss Proposes Six-Deck Streets.... 803
Newspaper Organizes Safety Campaign ... 835
Drivers of City's Cars Must Obey Laws.. 837
Full Use of Street Width in Rush Hours.. 839
Uniform Motor-Vehicle Code Progress.... 842
Rules for Surviving Pedestrians 842
Modern Use for the Ancient Catapult 843
Parking Difficulties Help Street Railway.. 867
Novalux Traffic Signals 887
Flashing Traffic Signals 889
Unclaimed Automobiles, Disposal of 828
Waste Disposal
Garbage Park, Oakland 787
New Garbage Destructors for Birmingham, Ala. 875
Water-Supply and Water-Works
Development in Palm Beach and West Palm Beach, Fla. 737
Why We Believe in Compulsory Metering. 749
Reduced Operating Cost, Mason City, Ia.. 775
Recent Improvements, Nyack, N. Y. 776
Twenty Years of Chlorination 791
Electric Pumping-Station, Kansas City, Mo. 794
Flat Rates Drowned Out..... 796
New System, Ridgewood, N. J. 816
Large Earth Dam Proposed, Westfield, Mass. 821
The Cleveland Reservoir 825
Two Tanks Used to Balance Pressure.... 829
City Uses Two Elevated Tanks..... 869
Self-Locking Box Tops 871
Curb Box Not Affected by Heaving Ground. 883
Tests for Chlorine Simplified 889

See also Municipal and Civic Publications, page 857

The offices of THE AMERICAN CITY, 443 Fourth Ave., New York, are headquarters for information on equipment for municipal work. If you want catalogs, prices or names of manufacturers, let us help you.

CARLOADS OF PERMANENCE

FOR THE NATION'S ROADS

A shrill whistle, a few short "chugs," the clink of a coupler, and another car of Truscon Welded Steel Fabric starts on its mission of road preservation. Carload after carload—going north and south, east and west—bear testimony to the widespread popularity of this reinforcement for concrete roads. And why shouldn't it be popular? It helps to withstand the stresses caused by freezing and thawing, by uneven bearing power of the subsoil, and by the passing of traffic. It reduces impact to a minimum by preserving a smooth surface. It preserves the integrity of the pavement and diminishes maintenance charges.

The welding together of the steel wires at every intersection insures the development of the full bond of the continuous wires and tensile strength of the steel. Its rigidity makes it easy to handle and place. It is furnished in sheets cut to any desired length so no wasteful lapping is required. In short, Truscon Welded Steel Fabric combines with economy every essential to the preservation of the Nation's highways.

Our handbook "Modern Road Construction and Field Book" sent free on request.

TRUSCON

TRUSCON STEEL COMPANY

YOUNGSTOWN, OHIO

Established 1903

Warehouses and Offices in all Principal Cities

TRUSCON
PRODUCTS FOR
REINFORCING
ROADS AND PAVEMENTS
WELDED STEEL FABRIC
CONTRACTION JOINTS
STEEL ROAD FORMS
RIB BARS
CURB BARS
EXPANDED METAL
Welded Steel Fabric for Permanency
Contraction Joints . . . . for Safety
Steel Road Forms . . . . for Economy
Rib Bars . . . . . for Reinforcing
Curb Bars . . . . . for Protection

Do you mention THE AMERICAN CITY when writing? **Please do.**

Vol. XXXVI
No. 6

The American City

JUNE
1927

443 Fourth Avenue
New York

50 Cents
$4 a Year

Water-Works Development in Palm Beach and West Palm Beach, Fla.

By Malcolm Pirnie
Hazen & Whipple, Civil Engineers, New York

THE world-renowned winter resort of Palm Beach before 1890 was nothing but a sand-dune, forming part of the east coast of Florida on the edge of the Gulf Stream and providing a barrier between the Atlantic Ocean and the mainland for a long, narrow and shallow salt-water lake known as Lake Worth. Henry M. Flagler, with his unbounded faith in the future of Florida, selected this for the site of his greatest winter resort hotel, the Royal Poinciana, and built the first section of it in 1893.

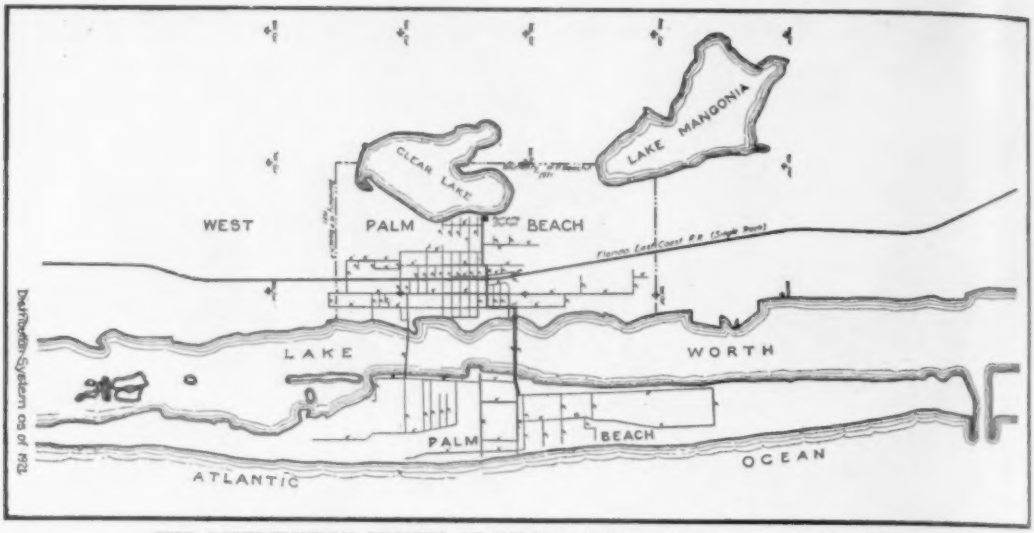
Almost immediately the problem of water-supply came into prominence. The shallow wells which were driven in the sand to supply the hotel became salt during the first season and it was necessary to secure a new source of supply. This was found in Clear Lake, one of a chain of lakes lying about a mile west of Lake Worth and separated from it by a second sand-dune. The water in these lakes was replenished yearly by overflow from the Everglades, which discharged northward through the chain of lakes and connecting saw-grass marshes to the Earman River, a tributary of the north end of Lake Worth. In 1894, a single steam pump and 8-inch pipe line from the lake across the old railroad bridge to the Poinciana comprised the total water-works of the locality.

Later, the land lying between Clear Lake and Lake Worth was subdivided in part, and water service at a nominal rate was provided from the hotel water system. The growth of the communities was normally rapid, as indicated by the records of consumption, until 1919. After this date a phenomenal rate of growth started, and it has continued to the present time. By reference to the consumption diagram it will be seen that a line drawn through the peak consumption months from 1916-1919 indicated at that time that a maximum of 2½ million gallons per day as an average for the peak month would be realized by 1930.

It was in 1919 that a filter plant was designed, of 3 million gallons per day capacity, to treat the colored water of Clear Lake, and from the date of completion of this plant, which went into operation in the winter season of 1920-1921, the real troubles of the water-works began.

The West Palm Beach Water Company had inherited the water plant and the franchise containing an arbitrary rate schedule. The scale of rates was far from equitable and too low to support the cost of service. The cities wished to have the water filtered, and the company was anxious to comply with the wish if the rates could be adjusted to take care of the increased cost. An increase of 20 per cent in the rates was finally agreed to in spite of the fact that it was estimated that a much greater increase was necessary, and when the water was furnished through the new filter plant, the cost of operation equaled the gross revenue, leaving nothing with which to pay interest on the money invested in the property.

The great influx of population began immediately, and the hourly peak demand in 1921 taxed the new filter plant to the limit of its capacity. The distribution system proved to be inadequate and a booster pumping-station was necessary in Palm Beach to draw sufficient water through the two 8-inch mains



THE DISTRIBUTION SYSTEM OF WEST PALM BEACH, FLA., AS OF 1921

crossing the new railroad bridge. Obviously, service was unsatisfactory, indicating that considerable capital was required to bring the water system up to its proper capacity.

Coincident with the rapid growth, the Palm Beach Canal and Lake Worth Drainage District were put into operation, cutting off the former source of water-supply to Clear Lake and reducing the supply catchment area from thousands of square miles to approximately three square miles.

MAINS—JAN. 1, 1921

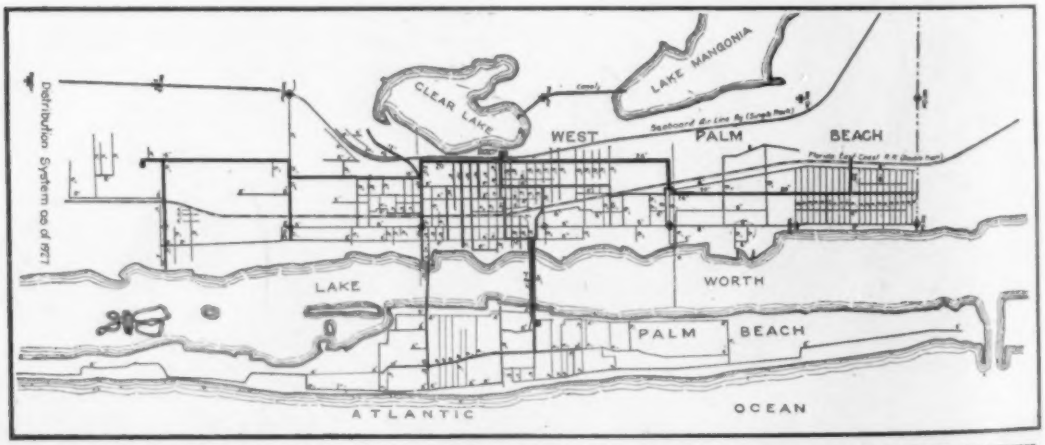
	West Palm Beach		Palm Beach		West Palm Beach and Palm Beach	
	Feet	Miles	Feet	Miles	Feet	Miles
14" C. I. Pipe	4,900	0.93	.....	.....	4,900	0.93
8" " "	12,790	2.42	8,200	1.55	20,990	3.97
6" " "	28,120	5.32	10,200	1.93	38,320	7.25
4" " "	41,520	7.86	19,700	3.73	61,220	11.59
Total	87,330	16.53	38,100	7.21	125,430	23.74
2" Galv. Pipe	97,100	18.39	20,260	3.84	117,360	22.23
1½" " "	4,000	0.76	.....	.....	4,000	0.76
1¼" " "	1,900	0.36	.....	.....	1,900	0.36
1" " "	2,000	0.38	.....	.....	2,000	0.38
Total	105,000	19.89	20,260	3.84	125,260	23.37

SUMMARY

C.I. Pipe	87,330	16.53	38,100	7.21	125,430	23.74
Galv. Pipe	105,000	19.89	20,260	3.84	125,260	23.73
Total	192,330	36.42	58,360	11.05	250,690	47.47

MAINS—APRIL 1, 1927

	West Palm Beach		Palm Beach		Palm Beach and West Palm Beach	
	Feet	Miles	Feet	Miles	Feet	Miles
30" C. I. Pipe	375	0.07	.....	.....	375	.007
24" " "	10,410	1.97	.....	.....	10,410	1.97
20" " "	16,188	3.07	.....	.....	16,188	3.07
16" " "	20,354	3.86	4,070	0.77	24,424	4.63
14" " "	4,500	0.85	.....	.....	4,500	0.85
12" " "	18,045	3.42	2,670	0.50	20,715	3.92
10" " "	11,725	2.22	10,035	1.90	21,760	4.12
8" " "	85,210	16.14	51,098	9.68	136,308	25.82
6" " "	161,712	30.63	30,795	5.83	192,507	36.46
4" " "	30,764	5.83	47,805	9.06	78,569	14.88
Total	359,283	68.05	146,473	27.74	505,756	95.79
3" Galv. Pipe	2,568	0.49	.....	.....	2,568	0.49
2½" " "	3,266	0.62	.....	.....	3,266	0.62
2" " "	313,150	59.31	33,685	6.38	346,835	65.69
1½" " "	13,159	2.49	.....	.....	13,159	2.49
1¼" " "	6,030	1.14	.....	.....	6,030	1.14
1" " "	6,418	1.22	.....	.....	6,418	1.22
Total Galv.	344,591	65.26	33,685	6.38	378,276	71.64



THE DISTRIBUTION SYSTEM OF WEST PALM BEACH AS OF 1927, SHOWING REMARKABLE GROWTH

SUMMARY

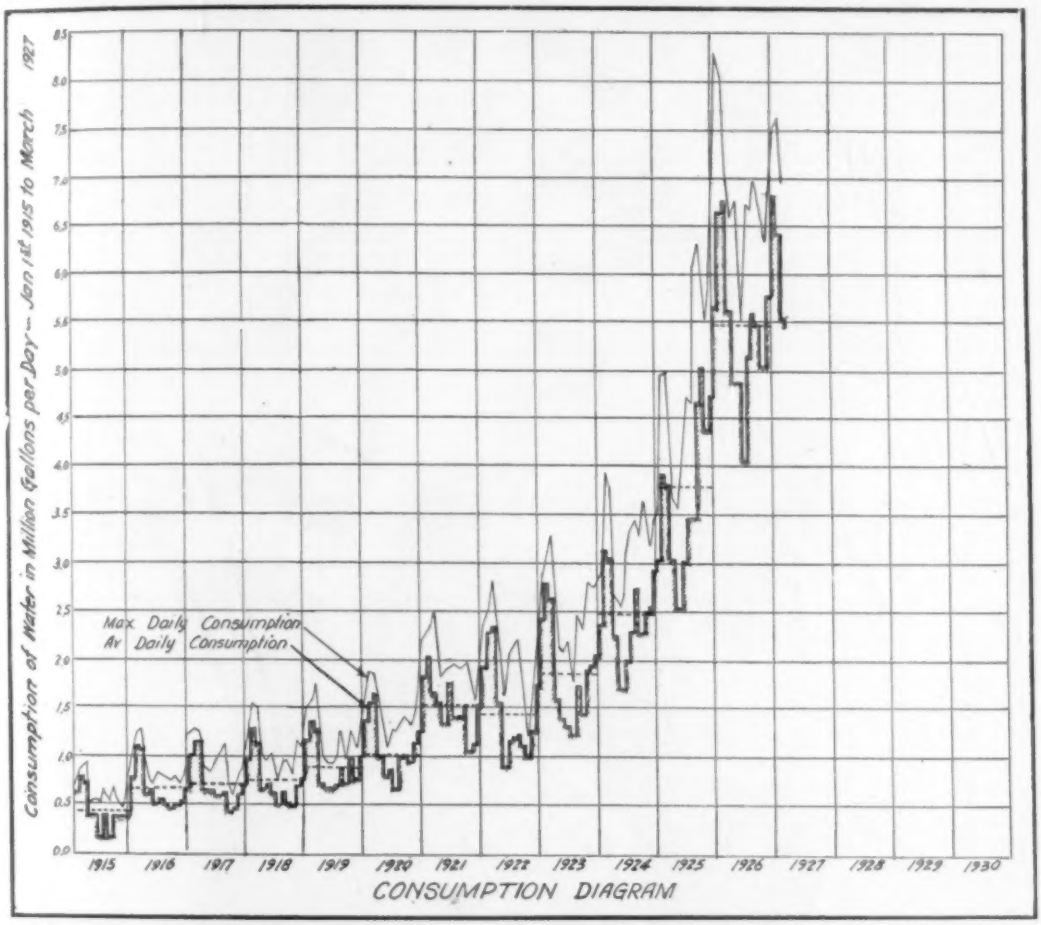
C. I. Pipe.....	359,283	68.05	146,473	27.74	505,756	95.79
Galv. Pipe.....	344,591	65.26	33,685	6.38	378,276	71.64
Total.....	703,874	133.31	180,158	34.02	884,032	167.43

In these circumstances, the consumption added to evaporation from the Lake rapidly lowered its level. Ground water that had been in contact with underlying deposits of limestone, entered the lake water, increasing its alkalinity from 12 to over 100. The required coagulant dose increased accordingly from 1.5 to 10 grains per gallon.

The Water Company was forced to buy the land between Clear Lake and the next lake to the north, called Lake Mangonia, and to construct a canal between the two lakes to bring the water stored in Mangonia back to Clear Lake. This relieved temporarily the serious water shortage of the summer of 1921, but it was obvious that with the old supply area cut off it was incumbent upon the Water Company to secure a new source of supply.

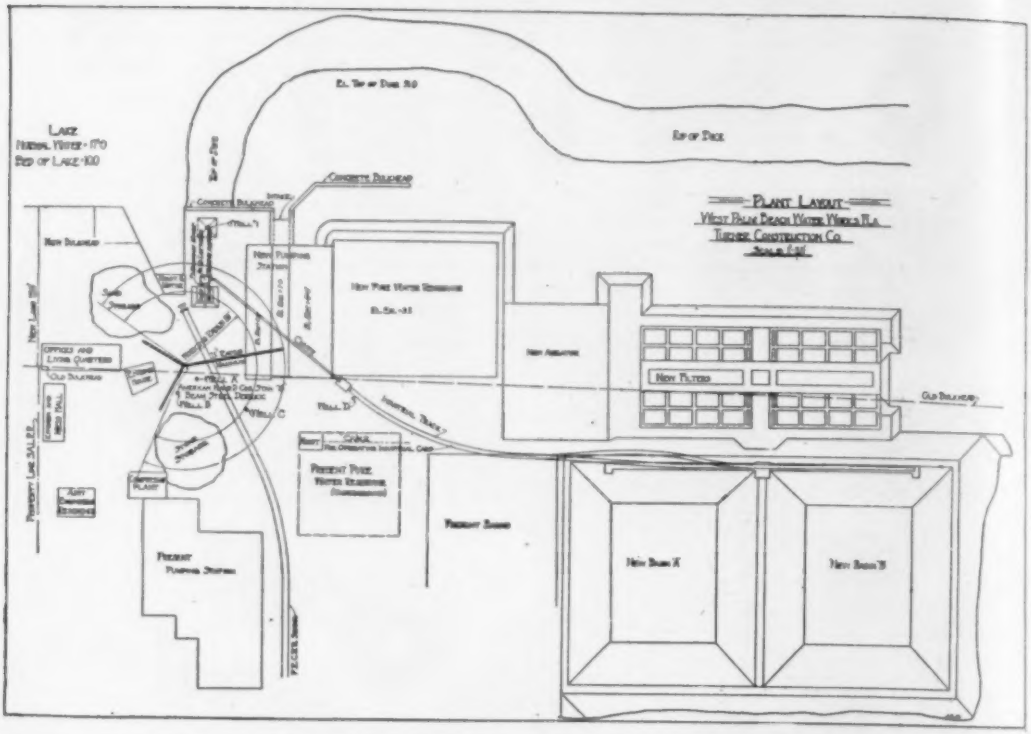
Additional capital in large amounts was required to buy land and extend the entire water plant. Money could not be borrowed on the financial history of the Water Company with existing rates in force. The entire situation was placed before the officials, who were invited to join the Water Company in an appraisal to determine the value of the property and fix rates that would give a fair return upon the investment in the plant.

In Florida there is no utility commission having jurisdiction over water-works properties, and the law of the state invests in the local governments the right to fix the rates of their own utilities. As the constituents of these local bodies must pay the rates as fixed by them, it is obviously poor politics for a city commission or town council to enact an ordinance increasing rates. West Palm Beach was no exception to this rule, and it was not until October 1, 1925, that a new rate ordinance



CONSUMPTION DIAGRAM OF WEST PALM BEACH WATER-WORKS, SHOWING STEADY INCREASE

For correction in average daily consumption, see end of article



GENERAL LAYOUT OF THE NEW WEST PALM BEACH WATER-WORKS, SHOWING ALSO THE PLANT LAYOUT USED BY THE TURNER CONSTRUCTION COMPANY IN BUILDING THE NEW PLANT

was obtained in West Palm Beach. In the meantime, extensions were held to a minimum and additions made each year calculated just to meet the absolutely necessary requirements of the following winter season.

The communities grew at an unheard-of rate, and water service decreased in proportion, until 1924, when the City Commission of West Palm Beach created a Board of Appraisers to appraise the property of the company and fix a rate to support the cost of service. Upon the understanding that the Commission would put the rates into effect as reported by the Board of Appraisers, the company began a construction program in 1925 costing three-quarters of a million dollars.

While the Board of Appraisers was at work, the Florida land boom was at its height, and a scheme was launched by local realtors and bond salesmen for the city to abandon its present water-supply for development purposes and to secure a new water-supply, piped 45 miles from Lake Okeechobee. Probably 10 million dollars' worth of water-works bonds would have been floated to buy and extend the property of the Water Company and install the new supply. The realtors would get the undeveloped properties near and in the lakes and after draining them would realize a large profit from the sale of the land in lots.

Strong public sentiment in favor of municipal ownership rose to fever heat, and the new City Commission which received the report of the Board of Arbitration refused to act upon it, having in mind that it would be cheaper to buy a utility operating on a starvation basis than to buy one furnished with adequate rates. The water plant was a bothersome and expensive property of the owners, but if it were thrown into the discard for a new supply several times as costly as the existing supply, both communities would suffer in the future by paying much higher rates for water than are required to support the existing supply. The sale of the property at that time to the city of West Palm Beach was prevented through conditions governing the sale price which were not acceptable to the city.

The resulting deadlock was finally broken on account of the necessity for extension of the distribution system, filtration works and pumping-station and supply works to coordinate the construction with the huge municipal program of sewer and street construction. The Water Company agreed to spend a million dollars in addition to the three-quarters of a million already contracted for since the appraisers

were appointed, and the city enacted the rate schedule reported by the Board of Appraisers and wrote the agreement into the ordinance. This ordinance was dated December 19, 1925, and called for the design and construction of the entire program before July 1, 1927.

During the summer of 1926 additional programs of street paving were authorized and the company was ordered to increase its distribution system to the extent of laying permanent cast iron mains under all the additional streets to be paved. As a result, the value of the Water Company's property, found by the Board of Appraisers for rate-making purposes to be 2 million dollars on September 1, 1925, has been much more than doubled by the completion prior to April 1, 1927, of a 2¼-million-dollar construction program.

A new 20-million gallon filter plant and pumping-station was designed, constructed and put into operation in 12 months, and 33 miles of cast iron mains from 6 to 24 inches in diameter were laid. This amounts to about half of the total increase of 72 miles in cast iron distribution mains installed between January, 1921, and April, 1927.

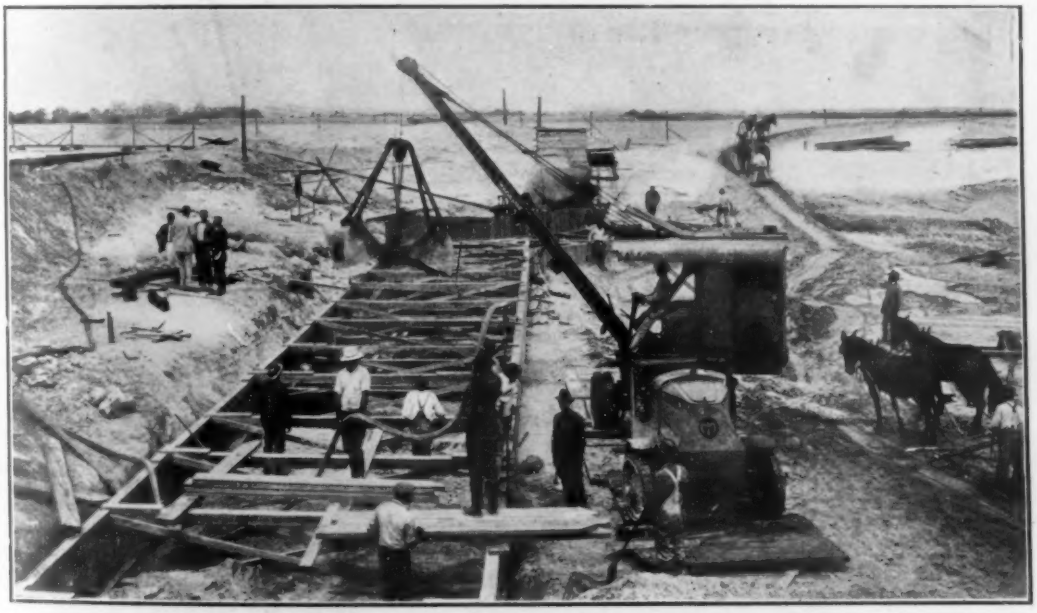
Construction of the Plant

It was necessary to locate the new coagulation basins, filters and pumping-station in the lake and adjoining swamp land, as there was not sufficient dry land available for these structures. A 12-inch electric hydraulic cutter dredge was operating in the lake to increase and improve the storage basins and this was used to provide the foundations for the new works. The foundations for the pumping-station and pure-water reservoir were cut to grade under water by the dredge, and the material from this excavation was discharged along the lake shore to the north to form the foundation for the filters.

Muck was stripped from the swamp under the site of the new basins by a dragline outfit, and sand was pumped on this area sufficient in quantity to furnish all the material needed for building up the sloping embankments of the basins. The basins were then formed by excavating the interiors with mule scrapers and depositing the excavated material to form the embankments. The insides of the basins were paved with 8-inch concrete slabs resting on concrete sills cast directly on the slopes of the embankments.

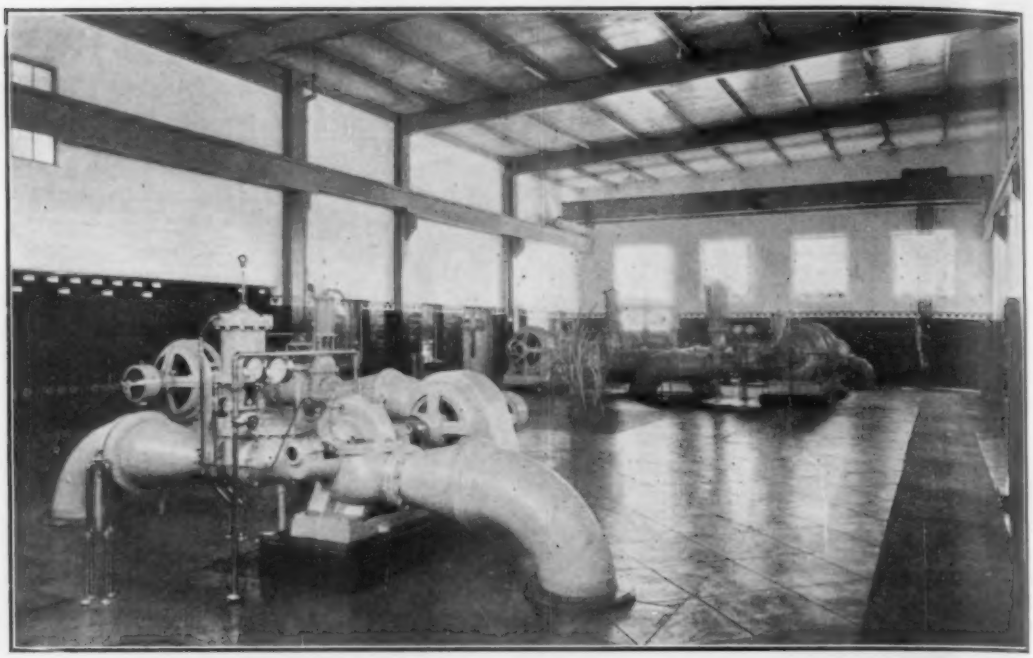
After the foundations for the pure-water reservoir and pumping-station were excavated, the dredge was moved out into the lake and was used to form a sand embankment from the south side of the filter fill around the western edge of the excavations, thus completely shutting them off from the lake.

The material is a very fine white sand having an effective size of approximately .12-millimeter and is therefore very resistant to the



JETTING 3-INCH WOOD SHEETING INTO PLACE ON THE INTAKE TUNNEL OF THE PUMPING-STATION OF THE WEST PALM BEACH WATER-WORKS

The sand dike is seen in the background, and beyond it the lake. Where the mules and excavator are standing, the hardness of the sand is noticeable, although it is 10 feet below the original surface of the lake and when wet took the form of quicksand



PUMPING-STATION OF THE NEW WEST PALM BEACH WATER-WORKS

flow of water through it. However, when it is necessary to excavate more than three or four feet below ground-water level in this sand, it becomes unstable, forming a dangerous quicksand. Fortunately, natural conditions in the underlying strata were most favorable for proper handling of the deep foundation work.

There is a bed of shells about 90 feet below the surface in which a number of open-ended wells had been driven, and the water from them used to supplement the supply from the old filter plant. These wells were pumped continuously and drew down the ground-water level 18 feet below lake level and made it possible to construct the foundations of the pure-water reservoir and conduits under the pumping-station in dry excavation.

The pure-water reservoir is of the groined arch type and is connected with the pure-water conduit under the pumping-station through sluice-gates. This conduit is also connected directly with the filters through a cast iron by-pass. The reservoir is held in place when empty by a 4-foot sand cover.

The pumping-station contains three elevated alum-storage bins which are filled directly from the cars by means of a bucket elevator. The alum feeds by gravity through dry-feed machines into the intake conduit, and the alum-treated raw water is picked up by the low-lift pumps and discharged into a loop pipe connected with the aerators discharging into the coagulation basins.

The filter recording instruments are in the main pump-room opposite the switchboard controlling the pumps, so that the entire operation of the plant can be controlled from the pump-room with the exception of the filter washing, which is controlled from the filters themselves.

The water after passing around baffles in coagulation basins flows on top of the filters and discharges into an effluent aerator under whatever head remains after the water has passed through the sand. From the effluent aerator the water passes through the chlorine chamber, then around baffles in the pure-water reservoir into the pure-water conduit under the pumping-station. The high-lift pumps lift the water from the pure-water conduit into another loop pipe connected with the distribution system. The coagulation basins hold 4 million gallons, and the pure-water reservoirs 1.4 million gallons. The filters consist of four 5-million-gallon units, each divided into four sections for washing.

Wash water is stored in a 250,000-gallon elevated tank connected with an old 500,000-gallon standpipe at some distance from the plant. This wash-water storage is filled from time to time with water taken from the wells, instead of using water which has been treated with alum and passed through the filter plant for washing the filters.

The new plant is so laid out that it can be easily doubled in capacity by simply extending

more coagulation basins to the north and by duplicating the filters and effluent aerator to the west of the present units.

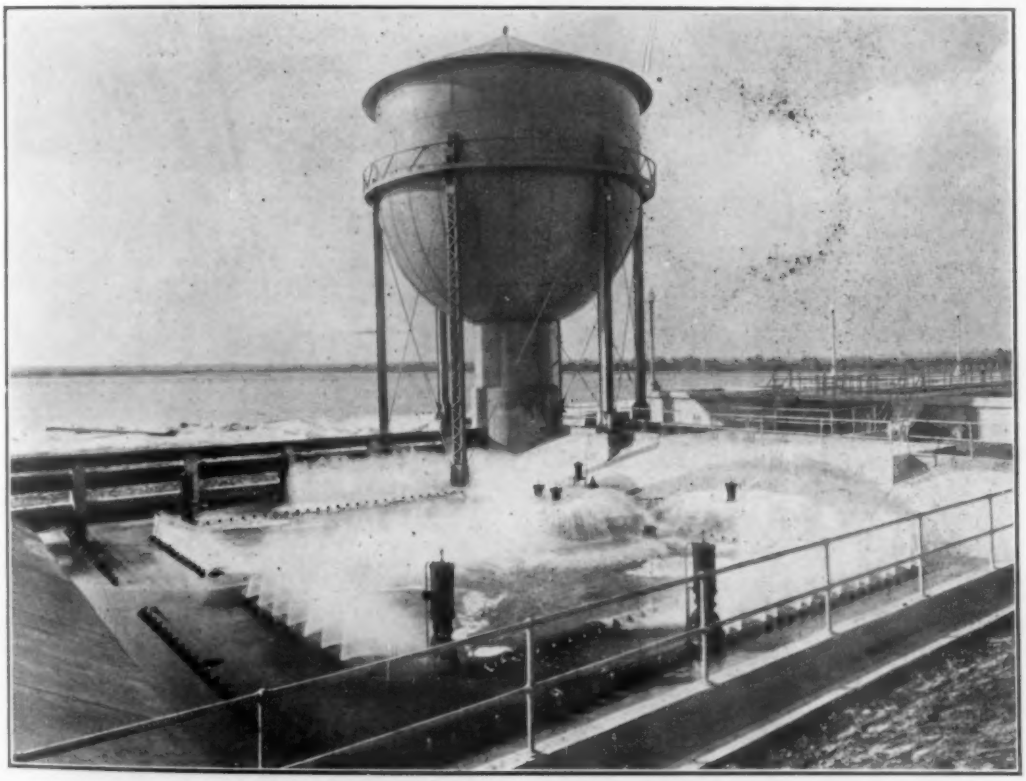
During the boom period water service was inadequate and little or no pressure existed at the ends of the distribution system in the maximum demand hours. The water which was furnished was forced through filters which had been increased in 1924 to 6 million gallons per day capacity, and an additional 2 million gallons of ground water was obtained from wells.

The 1926 construction work was absolutely necessary to provide the excellent service enjoyed in West Palm Beach during the past season. Water was delivered at a rate of over 12 million gallons per day to meet the maximum hourly demands in the month of January, 1927. This rate of delivery could not have been approximated with the plant as it existed on the first of January, 1926.

It will be noted from an inspection of the present distribution system that high-level storage is provided at two points remote from the pumping-station. A half-million-gallon elevated tank is located in Palm Beach, and a two-million-gallon standpipe is connected with the water system in West Palm Beach, on the ridge, approximately three miles south of the pumping-station. Provision has been made for the future construction of a duplicate two-million-gallon standpipe on the ridge, a little less than three miles north of the pumping-station.

The water-level in these standpipes and the elevated tank rides on the distribution system with Golden-Anderson altitude valves, provided to shut off the standpipes when full. No automatic valve is provided for the Palm Beach elevated tank, which is much nearer the pumping-station, with its overflow 12 feet above the overflow of the south standpipe and the north standpipe as planned. Bristol long-distance gages record on charts in the pumping-station the elevation of water in elevated storage and indicate to the operators when changes in rates of pumping are required.

In addition to the 95.8 miles of cast iron mains shown on the plan of the distribution system, there are 71.6 miles of galvanized iron mains, most of which are 2 inches in diameter. The present mileage in the distribution system is approximately four times what it was in 1921. In other words, the distribution sys-



WASH-WATER TANK AND EFFLUENT AERATING SYSTEM OF THE NEW FILTRATION PLANT
At the left are shown the nozzles spraying the effluent of a filter which is nearly ready to be washed, and in the foreground, in contrast, a cleaner filter, showing the difference in loss of head of the two filters

tem has been doubled twice in six years.

The accompanying consumption diagram is interesting when compared to the increase in the water-works. The average daily consumption for the year 1922 was 1.4 million gallons and for the year 1926 was 5.4 million gallons. This shows that the consumption practically doubled twice in a period of four years.

However, 1926 was a year of frenzied construction which maintained a much greater percentage of population than usual in the cities during the summer months. Indications at present are that the consumption during 1927 will average less than it did in 1926, but the average daily consumption during January of this year was higher than for January of last year. There is no indication that the end of the Florida land boom is going to interfere to a noticeable degree with the continued rapid growth of the Palm Beaches.

In a state where the law regards water as a common enemy, and thorough drainage is the aim of all landowners, it is obviously difficult to secure and conserve an adequate supply of surface water. Satisfactory well water from deep wells is impossible to obtain, and from the shallow wells it is too limited in quantity.

The present surface water after filtration is an ideal water for all purposes. It is extremely soft, practically colorless, without taste, and of a high sanitary quailty. Clearly, it is to the interests of both cities to assist in conserving the existing source of supply and in providing for its extension to insure an adequate quantity of water of this quality for the future.

EDITORIAL NOTE.—Information received after the preparation of the consumption diagram on the third page of this article indicates that the average daily consumption for January and February, 1927, should read 6.3 million gallons instead of 6.7 and 6.4 million gallons as shown.

Comprehensive Zoning Again Declared Constitutional by United States Supreme Court in Important Los Angeles Case

Full Text of the Opinion of the Court, Delivered by Mr. Justice Sutherland, May 16, 1927:

This is a proceeding in mandamus brought in the State Court to compel defendants in error to issue a building permit enabling plaintiffs in error to erect a business building upon a lot lying within a district of the city of Los Angeles restricted by the zoning ordinance of that city against buildings of that character. The ordinance creates five zones, designated as "A," "B," "C," "D," and "E," respectively, and classifies the kind of buildings, structures and improvements which may be erected in each. The ordinance is of the now familiar comprehensive type, but in the main regulates only the character of buildings which lawfully may be erected and does not prescribe height and area limitations.. It is assailed as being repugnant to the due process of law and equal protection clauses of the Fourteenth Amendment. The property of plaintiffs in error is in zone "B," in which, generally stated, the use is limited to buildings for residential purposes, churches, private clubs, educational and similar purposes. All buildings for private business are excluded, with the exception of offices of persons practicing medicine. The State Supreme Court, in a well-reasoned opinion, upheld the ordinance and denied the relief sought. 195 Cal. 497. And see Miller v. Board of Public Works, 195 Cal. 477.

Validity of Ordinance

The constitutional validity of the ordinance in its general scope is settled by the recent decision* of this court in Euclid v. Ambler Co., 272 U. S. 365; and upon the record here we find no warrant for saying that the ordinance is unconstitutional as applied to the facts in the present case. The property of plaintiffs in error adjoins Wilshire Avenue, a main artery of travel through and beyond the city; and if such property were available for business purposes, its market value would be greatly enhanced. The lands within the district were, when the ordinance was adopted, sparsely occupied by buildings, those in which business was carried on being limited to a few real estate offices, a grocery store, a market, a fruit-stand, and a two-story business block. Much of the land adjoining the boulevard within the restricted district had already been sold with restrictions against buildings for business purposes, although the property of plaintiffs in error and the adjacent property had not been so restricted.

Effect of Evidence

The effect of the evidence is to show that the entire neighborhood, at the time of the passage of the zoning ordinance, was largely unimproved, but in course of rapid development. The Common Council of the city, upon these and other facts, concluded that the public welfare would be promoted by constituting the area, including the property of plaintiffs in error, a zone "B" district; and it is impossible for us to say that their conclusion in that respect was clearly arbitrary and unreasonable. The most that can be said is that whether that determination was an unreasonable, arbitrary or unequal exercise of power is fairly debatable. In such circumstances, the settled rule of this court is that it will not substitute its judgment for that of the legislative body charged with the primary duty and responsibility of determining the question. Euclid v. Ambler Co., supra, 388, 395; Radice v. New York, 264 U. S. 292, 294; Hadacheck v. Los Angeles, 239 U. S. 394, 408-412, 413-414; Cusack Co. v. City of Chicago, 242 U. S. 526, 530-531; East v. Van Deman & Lewis, 240 U. S. 342; Price v. Illinois, 238 U. S. 446, 452.

Judgment affirmed.

* See THE AMERICAN CITY for December, 1926, page 771, and January, 1927, page 125; also "Single-Family Residence Districts Sustained by U. S. Supreme Court," April, 1927, page 444.

Type of Pavement and Its Relation to Street Cleaning

Abstract of Discussions at Seventh Annual Conference, International Association of Street Sanitation Officials

Discussion by John Klorer, Commissioner of Public Property, New Orleans, La.:

IN New Orleans we have street conditions in many respects unlike those in St. Louis or in Chicago or in Cleveland. We have a city without public alleys. It is practically as flat as a billiard table and some streets do not vary as much as 6 inches in elevation through a length of 4,000 feet.

To effectively drain our streets, we are obliged to carry all our storm water through subsurface drainage lines, located near each curb. It is the only way we can get the necessary slope to discharge the run-off into low-level canals. Practically the only surface slope we have is the transverse cross-section of the street from the center of the crown to the curb. Such a condition manifestly affects to a degree the amount of street cleaning that is permissible by flushing into the inlets of the drainage system. It also forces a large expenditure for the pick-up and the removal of the coarser street refuse.

Man has as yet devised no cheaper method of transporting material than by the hydraulic method or by sluicing, and fortunate indeed is that city which has undulating slopes on its surface or greater slopes in its drainage lines than the irreducible minimum by means of

POYDRAS STREET, IN THE WHOLESALE DISTRICT OF NEW ORLEANS, SHOWING A PORTION OF ORIGINAL PAVING WITH GRANITE SQUARE BLOCKS

The cleaning of a street with this character of pavement could not be satisfactorily done except by hose washing. After placing the asphalt top shown, it is now practicable to obtain satisfactory results with an auto-flusher at considerably less expense

which many cubic yards of its street dirt can be cheaply and safely transported hydraulically.

There can be no question but that the type of pavement has a definite relation to street cleaning in the matter of expense involved. It is apparent that the smoother the type of pavement, the less costly should be the cleaning. This is true not only as applied in comparison of one type of pavement with another, but is true also in comparing the cleaning costs of streets of the same type of pavement but of varying degrees of roughness.

It must be admitted, however, that there are other factors beside the type of pavement that contribute their share to the cost of street cleaning, and a fair, comprehensive study of street-cleaning costs with reference to type of pavement cannot exclude the consideration of these factors. Otherwise, false conclusions will certainly be reached. Some of the factors governing the cost of street cleaning are:

1. The time at which cleaning is done, whether by day or by night.
2. The quantity and character of street refuse.
3. The method of cleaning as influenced by parking or other conditions.
4. The standard of cleanliness required or the frequency of cleaning.

In some residential streets with ideally smooth pavements and where the vehicular count will not exceed 600 machines per day, the litter from falling leaves makes cleaning per mile more expensive than the cleaning of some of the busy commercial streets with pavements not so smooth and carrying three or four times the traffic. On the latter, the many moving cars fan the street dust to the curb, to the convenience of the street cleaner.

In the residential section of New Orleans perhaps the most potent factor that contributes to street-cleaning costs, even though the pavements be smooth, is the extent of paving that is present or is lacking on the intersecting streets. The show street in the residential portion of New Orleans is St. Charles Avenue and its continuation Carrollton Avenue. That portion of St. Charles Avenue extending from Lee Circle to Louisiana Avenue, a length of 8,100 feet or 56,000 square yards of double roadway, is swept four times a week by two patrolmen using hand brooms. A creditably clean appearance is maintained, principally due to the fact that nearly every intersecting street is a paved street.

A situation quite different exists a short distance further out on Carrollton Avenue where a number of unpaved streets intersect. Each of these yields to passing vehicles that enter the avenue a supply of Sharkey clay the removal of which necessitates the services of seven men to accomplish the same results as those accomplished by the two men previously mentioned on St. Charles Avenue.

Cleaning the Commercial District

As a general proposition, the most expensive street cleaning in every city is in that area known as the heavy commercial, wholesale, or industrial section, where the type of pavement is usually granite block. The quantity of refuse on these streets is more than the average, and the usual condition of the pavement is somewhat rough or uneven. This is due to the heavy tonnage moved and to the fact that repairs when made are usually made in a hurried and expeditious way, rather than in a careful, thorough way. This is done to minimize as much as possible the interference with business.

Horse-drawn, steel-tired traffic of the past has worn the square edges of the blocks to rounded corners, and the resulting street surface is one that cannot be cleaned by mechanical or pick-up sweeper and auto flusher. To clean such a street satisfactorily, one must resort to hand sweeping, supplemented by hose washing. This substitution usually entails an added cost of from two to three times the cost by motor sweepers and auto flusher.

There has been a notable improvement in the surface presented of recently constructed small granite block pavements due to the use of the asphalt mastic filler. There is less spalling of the surface than occurs on those granite block pavements where the joints have been cement-grouted. In addition to providing an easy riding surface, the modification in construction has contributed to reducing the cost of cleaning such streets.

Where a high standard of cleanliness is required on a street having this type of pavement in a cobbled or worn condition, it is advisable to place an asphaltic type of wearing surface, and the expense involved may often be justified in the savings over a few years in the cost of cleaning alone. Our experience in surfacing worn-out granite block pavements points to the advisability of not disturbing or resetting the granite blocks in order to get a more uniform surface on which to lay the asphaltic top. Better results are obtained in correcting the irregularities of the surface by the use of closer binders and then laying the uniform thickness of asphalt surface on this.

The remarks above with reference to resurfacing old granite block pavements apply as well to worn-out brick pavements. The expense of cleaning out brick pavements exceeds

NON-PICK-UP AND PICK-UP SWEEPERS MOVING FORWARD, SHOWING RIDGE OF DIRT BEING SWEPT INTO PATH OF PICK-UP SWEEPER, DALLAS, TEXAS

It is interesting to note the small amount of debris which is swept from the center of the street into the path of the pick-up sweeper. This is because so much material is fanned toward the gutter by motor traffic

if anything the expense of cleaning a granite block pavement. There may be instances, even though the initial investment in a brick pavement is not so great as in a granite block pavement, where the cost of adding an asphaltic wearing surface is a justifiable procedure from the viewpoint of reducing the day-in and day-out cleaning expense of a street in poor condition.

Manifestly, there is no justification in constructing a granite block pavement if it is proposed to lay an asphaltic wearing surface on the blocks. Better by far to eliminate the $4.50 to $5.50 per square yard for granite block and place additional concrete foundation at about $1.50 per square yard, but granite block pavements and brick pavements have their particular places to fill in some of the phases of street paving problems, as all paving authorities admit, and the recommendations above as to surfacing with asphalt are to be considered as applicable to meet special conditions only.

Concrete street pavement presents a certain feature that is commended from a street-cleaning point of view. To begin with, it is fairly smooth when constructed and becomes more so as a result of traffic. Progress is being made continually in correcting the tendency to crack, and where subgrade conditions are satisfactory, it maintains its surface intact. It is therefore the type of pavement that is susceptible of being satisfactorily cleaned with mechanical equipment. It possesses also the advantage of having a color which does not accentuate the presence of fine dirt or dust, and therefore it can remain unwashed for a longer period without presenting an objectionable appearance.

Asphalt surfaces represent the largest mileage of paved streets in practically every municipality. Being smooth, they are easy to clean. On the other hand, their dark color and the absence of joints tend to invite attention to what would on other types of pavements be a negligible quantity of dirt and dust. They therefore necessitate more frequent and more exacting cleaning.

The cleaning of asphalt streets is being made more difficult by the abuse of parking privileges, and the quarter of the street next to the curb usually shows the effect of dripping oils and gasoline by the indentations in the surface caused by standing traffic. Some cities that are reconciled to the parking nuisance are paving this portion of the street on new projects with concrete or brick for a distance of from 4 to 5 feet out from the curb.

Discussion by E. A. Kingsley, City Engineer, Dallas, Texas:

Residential sections do not present such difficult street-cleaning problems as do business districts. American cities a few years ago, excepting the White Way in New York, the State and Madison district of Chicago, and probably a few other similar districts in other cities, were dark downtown, or at least they were practically free of standing vehicles after six or six-thirty at night. Of later years, we have in the larger cities become a nation of "night owls." The moving-picture show and the automobile, with the vast increase in consumption and decrease in price of electricity, have literally turned our downtown districts from night into day. Our downtown streets are now filled

with automobiles parked next to the curb until the midnight hours.

This night parking has added to the difficulty in thoroughly cleaning the streets. They cannot be cleaned in the daytime because of traffic interruptions and continued parking. They cannot be cleaned before midnight for exactly the same reasons. This leaves but the few hours between midnight and six o'clock in the morning for taking care of the heaviest districts.

Of course, the same reasoning does not apply to the residential streets, nor do the residential streets have to be cleaned so often. We have found that in these districts, the daytime, or early in the evening, is by far the preferred time for cleaning the streets. The noise made by the cleaners during the late hours of the night is objectionable and the parking in the residential districts is not particularly heavy at night. Consequently, in Dallas, we have selected the daytime for the residential districts and the night-time for the downtown districts. The early hours of the night are spent in cleaning the streets in the wholesale or warehouse districts and the streets adjacent to these districts. The time after midnight when the theater crowds have dispersed is taken for cleaning the main business streets where the parking has been heavier. This system has been worked out by our street cleaning department and we find that it gives us ample time to take care of all our business district.

Dallas has adopted the double method of street cleaning, using both flushers and sweepers. The flushing method, where storm sewers are built, is entirely satisfactory, and in the business district and heavy-traffic streets is more satisfactory than any other method we have found. In the residential district where storm sewers are not available or where unpaved streets intersect, frequent flushing is not so well adapted as the sweeping method. The sweeping method, too, is much more satisfactory in the collection of rubbish and leaves in these districts.

On brick streets the sweeper is not quite so satisfactory as the flusher, because of the small amount of dust that will be left in the interstices of brick pavement. So far as the cost is concerned, we do not find any material difference between the cost of cleaning a brick, a concrete, or an asphaltic surface.

In operating our sweeper, we find that a most satisfactory method is to use a pick-up with a non-pick-up. We run the non-pick-up sweeper from the center of the street out, forcing the litter in the path of the pick-up sweeper which is following. The pick-up sweeper broom overlaps the edge of the path of the non-pick-up sweeper ahead and takes care of all the rubbish of one-half of the street. These two sweepers working in unison we find satisfactory.

The flushers are operated when the streets are practically clear of vehicles, forcing a sufficient flow of water to the gutter to carry off débris which is washed into the gutter. Possibly the flusher method is more economical in Dallas because the city water-works is municipally owned. Were our street cleaning department forced to pay the water bill necessary to flush our streets, there might be a considerable variance in the cost between sweeping and flushing.

The Dallas method of flushing the downtown district and sweeping the residential district is, I believe, the most satisfactory means of keeping our streets clean. The downtown district is cleaned every night of the year and the outlying districts at least once every week. The main traffic thoroughfares in the outlying districts are cleaned, of course, more often than once a week, depending upon the traffic they are called upon to carry. We have collection boxes for the deposit of papers and loose débris placed on the sidewalks in the downtown district, and we find that this box collection keeps a great deal of litter out of the gutters. In addition to this, we maintain a few pushcart men with shovels and carts in the more congested districts during the daytime. With these precautions and additional aids, we find that the flushers have no difficulty in thoroughly cleaning our streets at night.

We are using the Elgin type of sweeper in our residential districts and by using the non-pick-up and pick-up together we have reduced our original cost, as well as maintenance cost on the equipment. We find that this method answers our purpose fully as well as before the adoption of the non-pick-up sweeper. The middle and quarter sections of the streets are usually not very dirty. Because of this, the right half of the trash box on the sweeper was always full long before the left half had been filled. Consequently, our new method of using two sweepers does not materially increase the period of dumping our débris boxes. We have no trouble in keeping our residential streets perfectly clean, and we are well satisfied with the combined method of cleaning which we are now using.

The Fleishhacker Municipal Swimming Pool Is in San Francisco

The view of this pool, given on page 594 of the May issue of THE AMERICAN CITY, bore an incorrect caption.

Why We Believe in Compulsory Metering

Replies by Well-known Water-Works Superintendents to the Editorial in the *New York Sun* Reprinted Below

Read This!

Water Meters

(Editorial reprinted from the *New York Sun*)

"Wherever the use of water meters is compulsory the vendors are busy and plumbers prosper. Meters are used in New York to register and bill water for industrial, commercial and business purposes, but not in residences or apartment houses. It would require 500,000 meters to cover the premises not now metered, and if each apartment in a building were to be metered separately this number would be increased greatly. The New York field presents the richest outlet for the meter manufacturer.

"Recently a 'research bureau' connected with a meter manufacturing company issued a pamphlet declaring that metering all of this city's water would solve the water problem for fifteen years to come. The figures given by the research bureau are these: The city uses 830,000,000 gallons a day, of which 280,000,000 can be saved by installing meters. This estimate will not stand analysis. Already 26 per cent of the supply is metered, leaving 614,000,000 from which the saving must be made. There can be no point in metering water furnished free, for there is no incentive to save where there is nothing to gain. Thousands of schools, police stations, fire houses, court houses, hospitals and charitable institutions are supplied with water without charge. Water is now used freely in all seasons for street cleaning, for flushing sewers and to condition the parks. Putting this free consumption at the estimate of 100,000,000 gallons, there remain 514,000,000 gallons, which amount is to be reduced to 234,000,000 by the use of meters. All this economy is to be taken out of the persons who live in private houses and apartments. On the basis of the meter manufacturer's estimate of the quantity of water required to fill a bathtub and to flush a toilet, some of Mayor Walker's supporters may have to give up one or both of these desirable accessories of urban life.

"Does the city want its people to abandon the generous use of water? Schools have been teaching the children the hygienic satisfaction in, as well as the sanitary necessity for, the unrestricted use of water. It is capable of demonstration that the use of water is reduced when the price is increased. The meter will cut consumption, but not in the proportion of a third. It will stop some forms of waste, but it will affect the habits of cleanliness that civilization seeks to promote. It may be well to ask whether it will be wholesome now to teach this cosmopolitan population that money is to be saved by abstaining from the use of water."

Then Read the Replies on the Following Pages!

Caleb Mills Saville
Chief Engineer, Board of Water Commissioners, Hartford, Conn.

Photograph by Bachrach
CALEB MILLS SAVILLE

The first sentence of this editorial seems to me a question of opinion and not of fact. It would seem almost as pertinent, however, to state that wherever any construction or other similar work is in progress, contractors and material men prosper, as to say wherever the use of water-meters is compulsory, the vendors are busy and plumbers prosper. As a matter of fact, the water department itself, and not the plumber, usually installs the water-meter.

It seems hardly necessary in any well-informed community at the present time, whether or not they have engineering information, to defend the use of water-meters as a means of preventing waste. Records all over the country are available as facts, and therefore a personal opinion which is not based on facts is of very little value.

So far as the general subject of the effect of installation of water-meters on health is concerned, I presume that an opinion from some of the very able and well-informed health officers in New York City or New York State or the United States Public Health Service would carry almost as much weight as that of an editorial writer. So far as I know, no health officer of recognized standing has raised this question or confirmed this statement.

It is unnecessary to comment on the statements in the pamphlet of some meter-manufacturing company, when there are actual facts available for anyone who wishes to find them. One particular case, for instance: In the Metropolitan Water District of Boston in 1905, there was a population of 928,770 people using 113,922,300 gallons of water per day, or an average of 123 gallons per capita. At this time, about ten per cent of the services were metered. Shortly after this date, an act was passed requiring meters to be installed on all service pipes, in effect January 1, 1908. In 1925, there was a population of 1,303,020 people using 128,349,800 gallons of water per day, or an average of 99 gallons per capita, with about 97 per cent of the services metered.

Comparing these two dates, there was an increase in population of about 40 per cent, an increase in average daily consumption of 12.7 per cent, and a decrease in per capita use of 24 per cent, and yet it is not in evidence that there was any unusual addition to the wealth of the plumbers.

In our northeastern states, the average domestic use of water per capita is about 35 gallons per day, that in the highest-class apartment houses, about 45 gallons, and the most expensive single houses, thoroughly equipped with all modern plumbing appliances, and including use for washing automobiles, etc., about 80 gallons per capita, while the ordinary single houses and apartment houses run not much above 25 gallons per capita per day.

In view of this condition, it would appear that any reasonable minimum rate which might be established would provide such amounts of water that the "great unwashed" in New York City would not be increased appreciably.

The editorial statement regarding 100,000,000 gallons per day free water is fallacious and contrary to the recognized best practice, if this condition is to be allowed to continue, as might be inferred from the editorial.

In the opinion of all public utilities commissions and courts, furnishing free water for any purpose is discrimination by a public body and therefore may be a matter for court action by other consumers.

The best thought of today welcomes any legitimate method of preventing waste of water or any other commodity, and the continuance of needlessly wasteful methods is an indication of inefficiency and lack of common sense, as well as ignorance of modern practice.

Meters curb waste. They do not interfere with proper consumption, because the charges for water reasonably used are so small as to be negligible, even in the poorest quarters. I think the *Sun* editorial writer would have been on sounder ground had he attributed the lack of sanitary practice to the objection supposed to be inherent in the small boy, rather than to a horror of the water-meter in the cellar.

I must, however, agree somewhat with one contention of the writer and that is that some plumbers in New York will probably profit at the expense of niggardly tenement house owners, when the house meters begin to show up the extraordinary waste from poorly maintained plumbing and the choice lies between the plumber's bill and the water bill.

F. A. Rhodes

Manager, Operating Department, Bureau of Water, San Diego, Calif.

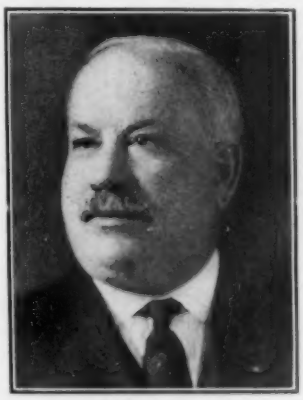
Hartsook Photograph
F. A. RHODES

I can safely say that the installation of water-meters does not affect the habits of cleanliness in the West. San Diego is 100 per cent metered. The minimum water bill per month is $1.00, and the average family pays for 5,000 gallons of water per month whether it is used or not used, so there is no incentive to cut down on baths.

The use of meters prevents great waste of water, both in the homes and in hotels and public industries. The consumer watches the plumbing to prevent wasteful leaks. In this country where water is so valuable, a metered service guarantees an incentive for saving, and the minimum bill specified by city ordinance, for different-sized meters, provides an ample supply of water for the purposes of sanitation.

E. H. Crofoot

Manager, City Water Department, Mason City, Iowa



E. H. CROFOOT

If a person would deny himself $1.00 worth of water, sufficient for a good bath once a week for a year at the average metered rates, he probably would not take the bath if the water was free.

Metered water is usually the cheapest item of man's necessities of life. People do not pay for the water, but for the service. They would not go 50 feet and carry the water, if it was free, for the average city's cost of service in keeping water constantly on tap for them.

There is an initial cost of that service, regardless of the amount used; the minimum charge is usually low, and for it ordinarily the consumer is entitled to use more water than the average family actually require. The fact that they are entitled to use that amount, and would get no credit for the using of less, is an inducement for them to use a reasonable amount.

While they may not think they are paying for unmetered water, the fact remains that they do actually pay many times the cost of metered water, though they do so indirectly, in taxes, higher rents, and higher living costs generally. It costs the community money to furnish water to its citizens, and all water wasted must be paid for. The metering of a city's water-supply doubtless reduces the amount of wastage, sometimes to very considerable percentages, so that the same pumping facilities, inadequate where water is unmetered, are adequate for several years upon the complete meterage of the city, thus reducing the overhead cost, or unrealized cost, to a far greater extent than any metering can increase the consumer's individual cost.

W. W. Brigden

Superintendent and Engineer, Department of Public Works, Battle Creek, Mich.

W. W. BRIGDEN

Shortly after the construction of our water-works we took up the matter of the use of water-meters. We found it impossible to ascertain in any satisfactory manner the uses of large consumers. Not long after reaching a general understanding of the meter question, we decided to meter all very large consumers. This was not difficult, as there was no great opposition. Next, we decided to meter all business places whenever a new service was put in or alterations were made in pipes and fixtures already installed. This proved a very good move in bringing about the installation of more meters, and we had only a small amount of opposition.

Some time afterwards we found the business institutions about all metered, and the question came up, what would be the next move. I was a little afraid of a general requirement

for more meters and consulted with the Board of Public Works as to how far they would be willing to go. As the Board was composed of some of the best business men in the city, their judgment and influence were good, and it was decided we should adopt a rule that all new services and all services where there were changes or alterations of any moment should be metered. Some opposition was brought about by this requirement, but it was not nearly as great as I expected. We let it be known that unless extensive additions were made to the former requirements for meters we should soon have to duplicate large mains and pumps, and install some mains in new districts. The expense for meters was large, but the expense of mains, pumps, buildings, etc., was much larger, and when provision was made for the next few years, it would be only a short time before it would be necessary to repeat the process of installing large mains, new pumps, new buildings, etc.

Our plan of requiring metering when the party made a change, and not forcing a large number of consumers to meter at one time, resulted in taking consumers a few at a time, and this reduced combined opposition. It would no doubt work the same way in other cities and towns.

As we commenced putting on meters early in the history of the water-works, we of course did not get the strong contrast in conditions, before and after metering that many cities have experienced. We have large manufacturing industries and they are constantly increasing their uses, and new ones are coming in to add to the amount of water pumped. For instance, the Grand Trunk Railway uses at its yards, locomotive shops, and roundhouse from four to seven hundred thousand gallons per day. This extra-large use has been in operation only for a year or two. It is evident that such a large demand balances years of additions in the way of residences and small houses.

The statement in the *New York Sun* that wherever the use of water-meters is compulsory the vendors are busy and the plumbers prosperous, is in a measure true. Any tendency to meter more than the usual number of consumers would bring additional business to the manufacturer of water-meters, but all my experience is that it does not add much, if anything, to the prosperity of the plumber. As stated before, it is not a question of the cost of meters alone, but many other items come in having a higher cost. If no meter is used, the consumer and his employees get in the habit of wasting water, and from our experience this habit is not corrected for some time after the water taker has found it necessary to restrain those having the handling of water and probably in some cases the restraint is not enough even to correct the abuses previous to metering. I can say with the greatest of assurance that without the metering of a large percentage of water consumers of a city, the demands for large expenditures will be so great as to leave the water department on the ragged edge every few years. It is conceded, I think almost without exception, that those water-works superintendents who have succeeded in having their systems metered are strong advocates for meters and think that is the only way to carry on a water department under good business conditions.

I am frequently in receipt of statistics showing the daily per capita consumption of various cities, and the percentage of services metered. Almost invariably the per capita consumption of metered cities is far below that of unmetered ones. The per capita of cities largely metered runs at a rate of 60 to 100 gallons, while that of metered cities runs from 150 to 400. Some cities that I know have been almost unanimously opposed to metering, but owing to the installation of filters and other extra-expensive construction, they have been obliged to put in meters after all. The fact is, they cannot do otherwise and keep going in any businesslike manner.

The manner of furnishing meters is often subject to dispute—inside the water-works fraternity as well as outside. When we began the installation of meters this matter was not as thoroughly discussed as at present, and we adopted the rule that we would rent water-meters on a basis of 10 per cent per annum of the net cost of the meter, and would sell them, if so desired, at actual cost. This has worked very well for twenty-five or thirty years. We found one thing objectionable in a few instances—that large consumers needing expensive meters wanted to rent them, so we adopted a rule that everyone using a meter larger then the one-inch size must buy the meter. I know that the buying of meters has been bitterly opposed, but the fact is, it has worked out in a perfectly satisfactory way in Battle Creek.

The question was raised in the *Sun* whether people would abandon the generous use of water. This same point has been made in many cities. We furnish school buildings and grounds with all their water. We furnish the parks and public buildings, water for flushing streets, settling-water, and sewer trenches, and for city purposes generally, and find there is a serious waste of water in most cases because there is no meter. No schedule of water-rates

can be arranged which will restrict a consumer so that he will not have plenty of water. People waste a large amount of water in sprinkling. This is done to some extent even in weather when no sprinkling is necessary, but if a man finds his lawn brown in long-continued hot summer weather he puts on the water ad libitum. There is absolutely no argument worth considering when it is stated that habits of cleanliness are decreased by the use of meters.

To sum up the whole matter: The opposition to meters is brought about either through ignorance or because the one making the opposition knows or fears he will be obliged to pay more money in the not distant future than he would if he could prevent the metering of his premises. Former illegitimate uses are cut off.

John W. Pray
Superintendent of Water-Works, Fort Dodge, Iowa

JOHN W. PRAY

As far as I am able to determine, the placing of water-meters on all our services has had no effect whatever upon the cleanliness of the community. I do not believe that any of our citizens are offering that as an excuse for not taking baths. Our people pay for exactly the amount of water which they consume and at a fair rate. This condition I think exists in almost all of our mid-western cities. I can see no fairer way of handling the sale of water.

We have 5,000 consumers in Fort Dodge and we have been 100 per cent metered for the past 25 years, and I am sure 99 per cent or more of our citizens are thoroughly satisfied.

I cannot understand how some people still cling to the idea that water should be sold by the month. It is the only public commodity that is not, in all cases, paid for according to the amount used, and I believe all cities, large or small, will come to the use of meters in the near future. It is not the use of water for bathing or any other legitimate purpose that causes abnormal consumption, but rather the wasting of it, and the service of the meter is to eliminate this waste.

H. F. Blomquist
Superintendent, City Water-Works, Cedar Rapids, Iowa

H. F. BLOMQUIST

It is apparent that the writer of the recent editorial on water-meters in the *New York Sun* has little knowledge of facts in regard to the effect of water-meters upon the use and waste of water.

Since water is the cheapest of all necessities, it is hard to stretch the imagination so far as to believe that anyone would restrict the use of water sufficiently to affect his personal hygiene for the purpose of saving a few cents per month. We find in our city, where all services are metered, that an average family gets all the water it needs for from 2½ to 3 cents per day, and it is inconceivable that one should try to save a cent or so a day by restricting the use of water below the amount necessary for sanitation. Anyone who is inclined to save has better opportunities to make a showing of saving in other ways. It is as logical to assume that people are now impairing their health by starvation because food is sold at rates which are based on the quantity used.

The legitimate use of water should not be restricted and it is our experience that it is not restricted by the use of water-meters, but that meters are the main factor in preventing wanton waste. This is a direct saving to consumers, and in some instances may be the cause of preventing a water famine.

Instead of paying more for water under meter rates, consumers will actually pay less, as was the case in most instances in this city when universal metering was adopted. Since the adoption of meters, our Water Department has improved its services and financed all its betterments and extensions from income for water at rates lower than they were twenty-five years ago, in addition to giving free water to all city departments.

C. B. Hoover
Superintendent, Division of Water, Department of Public Service, Columbus, Ohio

In Columbus we have a minimum rate of 40

cents per month, and all consumers who use 4,000 cubic feet per year, or less, pay the minimum charge. The average domestic use is 9,000 cubic feet per year, so there is a saving among those who use between the average rate of 9,000 cubic feet per year and the minimum rate of 4,000 cubic feet per year.

The following data show that there is no need of economizing in the taking of baths where water is sold through meters. Under Columbus conditions, an individual can take 52 baths per year for 20.8 cents:

Cost of water = 16 cents per 1,000 gallons.
Water required per bath = 25 gallons (a liberal allowance)
Average persons per domestic tap = 5

Frequency of Bathing	Cost per Bath	Cost per House per Week	Cost per Home per Year	per Capita per Day
Once per week.....	$0.004	$0.02	$1.04	18
Twice per week.....	0.004	0.04	2.08	36
Three times per week.	0.004	0.06	3.12	54

The average metered domestic tap uses 67,500 gallons of water per year, and with 5 persons per domestic tap. the average daily consumption is 37 gallons.

Stephen H. Taylor
Superintendent, Water Department, New Bedford, Mass.

STEPHEN H. TAYLOR

The only equitable way to sell water, like any other commodity, is to make the charge in proportion to the amount supplied. The flat rate, whether determined by number of fixtures, foot frontage, or any method other than by meters, puts a premium on waste.

It is a well-known fact that water fixtures will get out of order and leak. The house owner whose supply is not metered finds that it costs him nothing to waste water through these leaks, but to have a plumber repair the leak will cost money. So his logical course is to "let her leak" and save plumber's bills. This, of course, is fatal to the water distributor and might easily result in supplying more water for leakage than for actual use. This creates a necessity for additional supply, increased pumping capacity, larger mains, etc.

On the other hand, when the water rates are in proportion to the amount used, the householder finds it to his advantage to keep the leakage as low as possible.

In 1909, the New Bedford Water Board passed an order that all services be metered and charges made, based on the amount of water consumed. The installation was completed in 1914. As a consequence, the per capital consumption dropped from between 100 and 110 gallons to between 70 and 80 gallons. At the same time the receipts for water per million gallons pumped have increased from about $80 to as much as $109 with no change in the unit price.

Under the old fixture rate many families paid the maximum rate of $13.50 per year. This rate allowed an unlimited number of fixtures and the use of hose for sprinkling lawns and gardens in the case of a one-family house. Now, under the meter rate many of the same families pay considerably less and still use all the water they want but eliminate the waste caused by leaky fixtures.

There are also many families who now pay only the minimum charge of $5 per year for water. At the rate in force here, this allows 33,333 gallons per year, or an average of a little over 91 gallons daily per family.

The minimum rate should be sufficiently high so that there is nothing gained by reducing the consumption below that which should properly meet the best hygienic and sanitary requirements. On the other hand, it should be low enough to make it advantageous for the consumer to keep his pipe and fixtures in good repair, thus avoiding unnecessary waste.

Metering not only reduces the cost of treating and pumping the supply to any city, because of the lesser amount required; but it postpones the time when the city or the water company is obliged to make much larger expenditures in acquiring additional supplies. The larger the city, the greater the saving thus effected.

The writer has been informed by some of the owners of our largest tenement houses (where the water bills are paid by the owner and not by the tenant) that they much prefer the present method of paying by meter to the old flat-rate system. In such cases, the tenant has nothing to gain by reducing his legitimate consumption, as it does not in any way affect his own pocketbook. The owner, however, finds a sufficient reduction in the cost of metered water to more than offset the cost of eliminating leakage by keeping his fixtures in good repair. Both owner and tenant are better satisfied with a house where unnecessary leaks do not exist.

Our experience with both an unmetered and a completely metered system shows that metering does not unfavorably "affect the habits of cleanliness that civilization seeks to promote."

Replying to the last suggestion in the editorial in the *New York Sun*, I should say it certainly will be well to teach that money is to be saved by abstaining from the *waste* of water which benefits no one but those who furnish materials and power for treating and pumping the water, and those who profit by the enormous cost of the extensions of water systems to supply this unnecessary waste—a cost which must be borne by the water consumer or taxpayer.

D. R. Pringle
Superintendent, Water and Light Department, Thomasville, Ga.

D. R. PRINGLE

It would appear unbecoming in our little city to have a criticism from us on *The Sun's* editorial, for *The Sun* undoubtedly has the very highest type of engineers at its command or else they would not have written this type of editorial. We believe, however, *The Sun* is writing from a psychological instead of a physiological standpoint. *The Sun*, and every one else, knows that an abundance of water will not make a man clean up. We venture to state that there are probably as many dirty men living practically under Niagara Falls as live in the Sahara Desert.

Water-meters prevent waste only. The average family gets all the necessary water inside of the usual minimum charge. For instance, our local minimum is $1.00 per month, for which 5,500 gallons is allowed. This would allow 1,000 gallons per month for each of a family of five, and, unless water is wasted, this is sufficient for the needs.

Water-meters are fast becoming an absolute necessity, and we believe that metered services are as bound to come as the tides of the sea.

S. B. Morris
Chief Engineer, Water Department, Pasadena, Calif.

It seems rather difficult for us here in Southern California to appreciate the difficulty some communities encounter in seeking to place all water consumption upon a meter basis. Under the semi-arid conditions of Southern California with limited water-supply and phenomenal growth of population, no city would for a moment consider the sale of water by other than meter rates. The beautiful parks, golf clubs, and large lawn and garden areas about our suburban homes in Pasadena and other Southern California cities, are well known. All of these are furnished by water through meter and such water is paid for at meter rates.

S. B. MORRIS

Possible effect upon sanitary home conditions through meter rates is absolutely nil. Meters will, however, greatly diminish the needless waste of water without curtailing its use. In 1914 the city of Pasadena metered some 650 flat-rate services on its water system in the adjoining city of South Pasadena where no meters had previously been installed by the company which had been purchased by the city. After the installation of water-meters, there was a decrease of 41.3 per cent in the water consumed by this area, as shown by venturi meter readings of the total supply before and after metering of individual consumers.

Dudley C. Meyers
Commissioner of Public Works, Oak Park, Ill.

DUDLEY C. MEYERS

Oak Park is a residential community with a population of 60,000. We have 11,202 water consumers. Practically all of the water used in the village of Oak Park is metered. This includes not only water used for residential and commercial purposes but also all water used for construction work, public parks, drinking fountains, municipal buildings, fire-stations, etc.; all water except that used for fire purposes and

sewer flushing is metered.

We have a minimum charge of $1.75 per quarter. The schedule of rates for water over this amount is:

Class I. A minimum charge of $1.75 per quarter, not exceeding $7.00 per year, shall be made, entitling the consumer to use 9,000 gallons per quarter. A charge of 18 cents shall be made for each additional 1,000 gallons, payable quarterly.

Class II. A charge of 17 cents per 1,000 gallons shall be made to consumers of 100,000 to 200,000 gallons per month, payable monthly.

Class III. A charge of 16 cents per 1,000 gallons shall be made to consumers of 200,000 to 600,000 gallons per month, payable monthly.

Class IV. A charge of 15 cents per 1,000 gallons shall be made to consumers of over 600,000 gallons per month, payable monthly.

Class V. A charge of 20 cents per 1,000 gallons shall be made for all water used for construction purposes."

I do not think that the use of water-meters in Oak Park has tended to affect in any way the "habits of cleanliness that civilization seeks to promote." We have been somewhat restricted in the use of water because our water-supply comes through the city of Chicago and at times the supply was not sufficient to meet our demand. We had complaints from citizens that they did not have enough water for household purposes, to say nothing of lawn sprinkling.

We installed a 5-million-gallon underground reservoir, which we now use in conjunction with the supply from Chicago and at the hours of the day when we have our peak demand.

I think it is a desirable thing to have a minimum rate, although I do not believe this would make a difference or has very much bearing on the question of how much water the average family ought to use.

William Shardlow
Superintendent of Water-Works, Cherokee, Ia.

WILLIAM SHARDLOW

After having read the *New York Sun* editorial, "Water Meters," I feel that it is the result of a wish of many cheap politicians to make a play for votes from the poorer people of their ward by making a stand for flat-rate water service and always being on guard to prevent water-meters from being installed.

We have not found that the installation of water-meters makes people more dirty or unsanitary, but we did find that putting meters in service saved the city from providing additional water-supply for a long time.

There is only one proper way to sell city water and that is—100 per cent metered; our service has been metered since 1898.

New York had better get into the bandwagon and install meters on all services.

J. W. Crow
Superintendent, Water and Light Department, Ponca City, Okla.

J. W. CROW

In my opinion there is no water company that ever made a dollar on flat rates. They simply cannot keep from losing money. I do not see how any sensible person could put up the argument that is stated in *The Sun* editorial. Water-meters are the only true means of measuring the amount of water.

It has been my experience on flat rates that customers will neglect the plumbing and unnecessary leaks around the house, turn on the garden hose, forget it and go to a picture show or go visiting, and flood the whole country—not deriving any benefit themselves from it. The old idea that it doesn't cost anything to let it run, makes it hard for water department in pumping water that is not accounted for.

There is no question in my mind that the amount of water being used per day in New York City could be cut considerably if all customers were metered. As to water-meters keeeping the housewife from using the necessary amount of water—it is all bunk, in my estimation.

Ponca City is 100 per cent metered, and other cities that I have had charge of have also been 100 per cent metered. The amount of water that we allow for a minimum at a very small cost gives the housewife ample water to use and also gives us a check on all leaks or wasted water, and in that way our pumping cost is kept down to a minimum.

I even put water-meters on all city buildings,

all parks, and other places that have free water, and keep as accurate an account as I do on customers that are paying for it. In this way I can check the amount of water that is used against the amount that is pumped, and know exactly the efficiency I am getting.

P. J. Hurtgen
Director, Department of Public Works, Kenosha, Wis.

P. J. HURTGEN

The small amount of water used to promote cleanliness is such a small percentage of the total consumption that the consideration of habits of cleanliness from that standpoint is absolutely negligible.

Since 1918 the city of Kenosha has been 100 per cent metered. We meter all our fire line services, regardless of size, all our schools, both public and parochial, all churches, fire and police stations, hospitals, clubs, city parks, and also the City Hall. All these organizations pay at the regular scheduled rates for the water that passes through the meters. Water for street cleaning, street sprinkling and flushing, sewer flushing, trench flooding, and flooding skating-ponds in winter, is taken from the fire-hydrants. The various departments so using city water are charged for the actual amount used, where it can be measured, and in some cases the bill is based on the length of time water is passing through the hydrant.

The city of Kenosha purchased the original water plant from private interests in 1895. The population at that time was about 6,500 and there were 337 consumers of lake water; of this number 16 were metered. Metering was continually encouraged by the Water Department, and in 1917 a survey was made of our metered services and we found 87 per cent of the services metered. In May, 1918, the Railroad Rate Commission of Wisconsin ordered all the services metered, including all fire line services. The Water Department, needless to say, welcomed this order, and at the close of 1918 we were 100 per cent metered—and have been so ever since. The residence consumers, therefore, were rather gradually sold to the idea of the merits of a system of water sales based on the actual amount used.

Our few complaints because of high water bills, upon investigation, are usually due to faulty plumbing. What inducement can be offered the consumer to have his plumbing repaired if the service is not metered? During the dry months in summer much water is wasted on lawn sprinkling by permitting the hose to run all night. This occurs in our city with all lines metered. How much more aggravated would this situation be if no measuring device were placed on the line? All of the water furnished our patrons is supplied from Lake Michigan, and is filtered, treated, and pumped at considerable expense. Why permit the indifferent consumer to waste this pure water at the expense of the consumer who uses only what he needs?

According to United States Government reports, the average annual water bill paid by our domestic consumers in 1925 was $10.80, or 90 cents per month.

In 1925 a "Better Cities Contest" was conducted in Wisconsin, to determine the best city in Wisconsin in which to live. Various cities of the state submitted data and facts setting forth their claims to the honor of being the best city in the state. The data were reviewed by experts of national prominence, and they awarded the city of Kenosha first place.

In this contest the health of the people was an important consideration; and the fact that we won first prize and procured a high rating as a healthy community, particularly as we are an industrial city with a mixed foreign population and are 100 per cent metered, is sufficient evidence to satisfy me that meters do not curtail the use of water by our patrons and thereby in any degree produce an unhealthy community. Our death-rate per thousand population in 1926 was 7.6.

The death-rate per thousand in cities that are only partially metered, taken from the U. S. Public Health Records for 1926, is as follows:

Kansas City	13.7
Chicago	11.7
New York City	12.9
Louisville	14.9
Boston	14.9

Our schedule of rate provides a sliding scale as follows:

The first	5,000	cubic	feet	are	$1.20	per	1,000	cu. ft.
" next	5,000	"	"	"	1.00	"	"	" "
" "	10,000	"	"	"	.90	"	"	" "
" "	30,000	"	"	"	.80	"	"	" "
" "	100,000	"	"	"	.70	"	"	" "
" "	150,000	"	"	"	.60	"	"	" "
" "	700,000	"	"	"	.50	"	"	" "
All over	1,000,000	"	"	"	.45	"	"	" "

As previously stated, the average water bill based on these rates is not so high as to discourage generous use of water.

In reply to the statement contained in the editorial of the *New York Sun*, "Wherever the use of water meters is compulsory the vendors are busy and plumbers prosper," "the vendors are busy" means little because meters are purchased on a competitive basis. As for the plumbers, they have nothing whatever to do with the setting of our meters. All our meters are set and repaired by our meter department.

The *Sun* editorial savors of politics, and if cities must let politics instead of good business judgment control them, why always involve the water departments? As a general proposition, I think it is safe to make the assertion that cities that are not metered are controlled by politicians whose actions are controlled by votes rather than good, sound business principles.

I believe that every city should be 100 per cent metered.

John H. Kuester
Superintendent, Water Department, Menasha, Wis.

JOHN H. KUESTER

We have never operated our water-works without meters since it was started, in 1905. We do find some trouble in trying to convince people that meters are a justified necessity, as some people think they always ought to stay within a minimum charge and when waste occurs to bring the bills up quite large they think we ought to discount or refund some of the excess over the minimum.

The cost per bath is so small that we cannot see where meters with proper rates for water tend to cut down the number of baths they should take. I know in our home the cost for water to take a bath never enters our mind.

I think that consumers should pay for water only actually used and I believe that Milwaukee has the ideal system wherein they assess the costs of installation of mains, services and meter to the consumer and charge everyone a uniform rate for water used only.

A. J. Muth
Superintendent, City Electric Light and Water Works, Goshen, Ind.

I was amused, and felt that although the editorial published recently in the *New York Sun* was interesting, the author was certainly misinformed or having a dandy dream. Our water is all metered and the people of Goshen all seem to be as clean as the cleanest.

H. S. Crockett
City Superintendent, Elmhurst, Ill.

H. S. CROCKETT

When the city of Elmhurst took over the old water company in 1920 there were only a few water-meters in service. The majority of the accounts were on a flat-rate basis, at so much per quarter. As soon as the city took charge, every water user was notified to install a water-meter as soon as possible. Of course, there was considerable objection by some of our citizens, but after the installation of meters we found that in most cases the flat rate was reduced.

To my knowledge, our citizens use just as much water for cleanliness today as they would use if the city had continued on the old flat-rate proposition. Personally, the writer does not think that a moderate rate per thousand gallons of water is going to prevent anyone from keeping himself or his premises clean. In my opinion, it is as essential to meter this water to the consumers at it is to meter the current for electric light or the amount of gas consumed; for water is a greater necessity of life than either one of the other two, and why should not the consumers be as willing to use water as freely as they do the other necessities of life? In the long run it is more beneficial to their health. Under no circumstances would the writer consider the flat-rate schedule for the use of water.

J. A. Jensen
Engineer of Water-Works, Minneapolis, Minn.

Our observation is that after many years of fully metered supply under a minimum charge plan of $4 per year, every person has all the water required for sanitary purposes and that even an increase in rates will not affect his manipulation of the faucet when he is about his toilet activities.

When agitation is begun for water-meters on a water-supply for a city where universal

J. A. JENSEN

metering is not in vogue, many opposing arguments are used by the uninitiated which are not based upon facts or at all well founded.

It is usually pointed out that manufacturers of meters are the only ones to profit by their use, and that unsanitary conditions arise where unrestricted use of water is not permitted. Neither is true. "Generous use of water" usually means reckless and wanton waste.

It may be true that water costs nothing at the source. It may be said that it should be "free as air." That is where the argument stops. On the other hand, it costs money to collect the water. It costs money to purify the water. It costs money to transport the water. It costs money to place the water at the disposal of the consumer. After a cost price has been placed upon each delivered gallon, wastage or unnecessary use of it becomes an economic loss.

A compilation of data was made in 1926 by the city of Chicago on this question, for which all the large cities were asked to furnish facts and figures. In 16 cities of over 200,000 population where universal metering was adopted, the water rate per 1,000 gallons averages $0.166, and the average per capita consumption is 110 gallons per day. In eight cities of over 200,000 population where universal metering was not adopted, the water-rate per 1,000 gallons averages, as computed, $0.179, and the average per capita consumption is 167 gallons per day.

These figures show that the metered rate per 1,000 gallons is less than the unmetered rate. The meter owner at least has a return directly in his favor. Furthermore, the average per capita consumption under the metered system gives each man, woman and child 110 gallons per day—2 1/5 barrels. This is for the usual purposes, including that for cleanliness or sanitary purposes. Of course it is to be admitted that the domestic consumption would not yield this amount, but even if it were discounted 50 per cent, one person ought to be able to keep reasonably clean by the allotment of a barrel of water per day.

Most cities have a minimum rate for metered household use which places no restrictions upon the necessary use of water. In Minneapolis, where services are 100 per cent metered, the average per capita consumption is 108 gallons per day and at the prevailing rate is less than 2 cents per ton for filtered water delivered at the faucet. Evidently habits of cleanliness or sanitation are not affected by either the quantity or the price. The sanitary bogey is a myth.

In the metered and unmetered cities the difference between 110 gallons and 167 gallons per capita, as above cited, indicates loss or wastage, generally speaking, which is preventable by metering. This amount on the average is 57 gallons per person, as shown by the collected data. The average population of the eight cities where universal metering has not been adopted is 1,721,000. The average daily saving in water wastage in the mean of these cities would be 100,000,000 gallons, and with the allowance for meters of 20 per cent in these same cities the net saving would be 78,000,000 gallons per day. Allowing for partial metering according to the data, the saving in New York would be 116,000,000 gallons per day, in Chicago 514,000,000 gallons, and in Philadelphia 77,000,000 per day. The only reduction in these quantities is that determined by the minimum per capita consumption as affected by commercial demands.

Whether this reduction in demand is in watersheds, impounding dams, purification works, or pumping equipment, every water-works man understands the unit cost per million gallons of capacity of plant. The saving represents millions of dollars of capital investment. The water consumer is relieved of an unproportionate tax burden for the price of a meter that will pay for itself.

James Sheahan
General Superintendent, Water Department, Memphis, Tenn.

JAMES SHEAHAN

Comparing the Memphis water-supply to the New York water-supply is like comparing a sparrow to a turkey. The Memphis water system is 100 per cent metered. We formerly had about the same proportion of meters to flat-rate connections as New York has. We changed all our

flat-rate conections and put in meters, not for the purpose of raising the rates or getting more revenue, but with the idea of saving water. The Memphis water-supply is artesian, and we pump all our water from the ground. The Water Commissioners thought at the time of this change that a great deal of water was being wasted, which was true, but even with meters a great deal of water is wasted, from leakage caused by the consumers' carelessness in not repairing leaky faucets, flush tanks, and other plumbing fixtures.

We agree with the *New York Sun* that the amount of water which is claimed to be saved by meters is impossible. At the time meters were installed in Memphis, we saw very little difference, as the meters were put in slowly, but about the same time the rates were raised on account of the cost of all material used by the Water Department, advance in labor, and everything else. There was considerable reduction in water consumed the first year, but now it is back to about where it was. We do not think the rates are any higher now than they were on the flat-rate system. About 40 per cent of our water consumers pay $1.00 per month, for which they receive a maximum of 300 cubic feet of water, after which the rates become cumulative. Our estimate is that about 60 per cent of the consumers do not pay more than $1.50 per month. We notice that the New York maximum price is 13.33 cents per thousand. Our maximum rate per thousand is 34 cents, but our average price is 18 cents. We do not know whether the New York rates are on a sliding scale down or not.

We furnish free water for street sprinkling, to the Fire Department, public schools, parks, and all charitable institutions, just as some other large cities do, only we meter all these places to see how much water they actually use. This gives us a record of whether or not they waste the water. If we find the water is wasted, we immediately call the consumer's attention to it in order that leaks may be repaired. We think if New York, or any other city, would meter their free water, a great deal would be saved. This is also true of the small consumer. A leak develops in a private service, and the meter reading shows it. We notify the consumer and he immediately has repairs made. If he does not, we charge him the full amount for the water. The consumer can save, if he will, a great deal of water that is wasted through carelessness, but we cannot believe that the small saving made by any consumer will amount to enough to make him cut down on the supply of water needed for cleanliness or other purposes.

The Water Department installs all water-mains, meters, and water services, and pays for them out of funds derived from the sale of water.

All large cities are anxious to protect the small consumer of water, yet all free water, water for fire protection, park purposes, street cleaning ,etc., is charged to the small consumer as well as the large one, instead of being taken care of out of a general tax. We think that if cities really want to help out the small consumers (and we mean by that the renters) and reduce the rates to them, all free water should be paid for by a general tax. This is merely my own opinion of the water-supply situation.

John A. Brown
Superintendent, Water Department, Glen Ridge, N. J.

Glen Ridge is 100 per cent metered; we probably have more bathtubs and toilets per capita than any other municipality in the metropolitan district; an inspection of our schools, and a general survey of our people, individually or as a whole, will prove to any one that the use of meters has not affected the habits of cleanliness that civilization seeks to promote.

About the middle of the second clause in the editorial on the use of water-meters, in the New York *Sun* it is stated that there can be no point in metering water furnished free, for there is no incentive to save where there is nothing to gain. I differ with the writer. Meter readings show very often that water is being wasted by reason of defective plumbing fixtures in public buildings, and the proper repairs are made to prevent such waste as soon as the reading is compared and found to be greater than usual.

Water-meters are guardians against waste. They place the burden of wastefulness where it belongs—on the careless owner or tenant who permits leaky fixtures to continue to drain the reservoirs and burden the system with extra, useless capacity.

Civic Team Work by the Project Method

Community Progress by a Small Group of Leaders, Enlisting Organization and Official Support for One Project at a Time

By Walter Burr

Professor of Sociology, Kansas State Agricultural College

EVERY high school boy knows that "All Gaul is divided into three parts," and a modern prince of industry has introduced us to "fifty-seven varieties." But neither ancient Gaul nor the modern pickle has anything on the average local commuity when it comes to divisions and varieties in organization.

It is one thing to complain about the divisions in the local community, but quite another thing to do something about it. All sincere workers at the community job have tried to solve this problem. But it is loaded, and often blows up with dire results to the community worker.

For an outsider to go into this community and act as peacemaker brings the results usually secured in the attempt to enter unbidden and try to settle a family quarrel. The community specialist soon learns this fact and seeks other measures than the ineffective ones of the pacifist.

The Community Council is one of the devices proposed for getting things done effectively without disrupting the organized life of the local community. This council is a body representative of all organized agencies, designed to act as a general clearing-house for programs of community action. The theory is that with every organization having a representative on this committee, the force of each agency can be gotten behind any project launched by the Community Council.

In theory the scheme looks good. As a matter of fact, it has seldom if ever worked. Not all local organizations are interested in community progress and welfare. Some are definitely opposed to it as being unbecoming "worms of the dust" who are at best "but pilgrims here." The uninterested ones will cooperate by appointing retired and harmless individuals to represent them on the Community Council; very good persons, all—so good that they are good for nothing. There will also be at least one strong organization that will see the chance of capturing the leading place in the movement, walking away with the leadership, the place of meeting, and possibly the funds. Their leaders believe in team work—provided they can drive the team.

Four Rules of Action, Taught by Experience

Enough experiments have been tried, however, to have taught us some definite rules of action:

1. There must be in a local community a central group of persons with community vision, influence, and willingness to spend time and money for local betterment.

2. This local personal group will be established in the central place by whatever means is practical in view of the local organized conditions. It may be necessary for them merely to *assume* the place. Or for a time, they may work successfully through the organization of a Community Club as a general popular body to give public sanction to and interest in the work attempted.

3. Where this group has worked successfully, it has not been through any eagerness to maintain the organization as such, but rather through a determination to get things done. Therefore, work has been done by the project method, in the campaign spirit. Water-works and a sewer system are needed, for example. Very well, boys, *Let's go*! The thing is put across in an enthusiastic campaign, as though this were the only achievement planned by the group. Then a community park is dreamed of. Here goes another campaign—and presto, we have it! After a rest for the folks to catch their breath, somebody suggests a community house. The campaign proceeds, and there stands the building, completed and paid for. There may have been little organization, and what there was may have gone to pieces several times. You may look into that community at the present moment and find no Community Council, no Community Club, no Central Committee; but you will find the achievement of water-works and sewer system, a park and playground, and a community house.

4. When a community once begins to go by the project method, it never permanently stops. It may fall into a condition of rest for a time, but the people have felt the thrill of working together in the creation of these real children of their social communion, and the process will continue.

Sewer Maintenance and Catch-Basin Cleaning in Chicago

By George E. McGrath

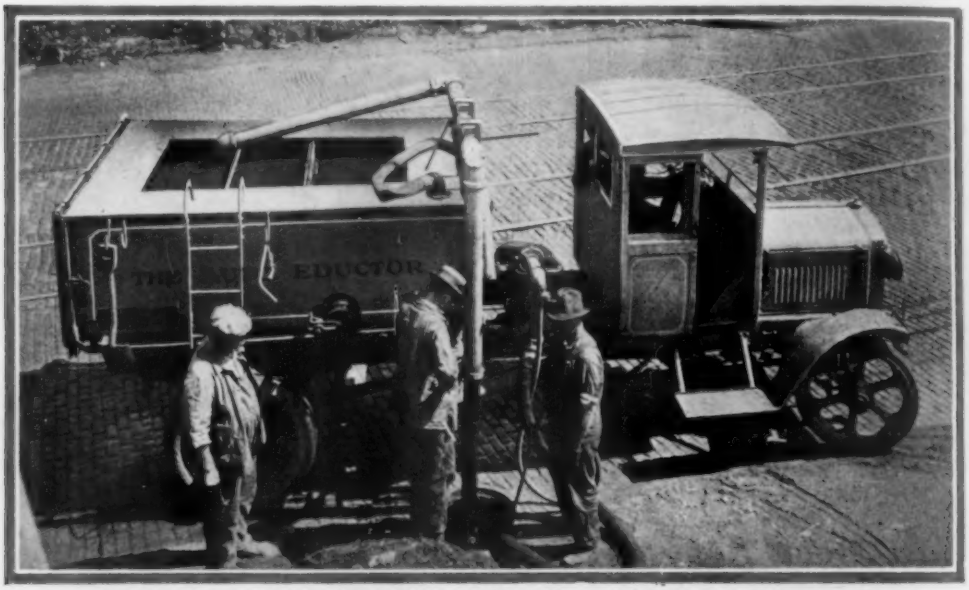
Superintendent, Bureau of Sewers, Chicago, Ill.

THE city of Chicago is served by a combined sewerage system. The city is almost as level as a table, and the sewers, of necessity, have very little pitch and it is of the greatest importance that street dirt be intercepted before reaching the sewers. We endeavor to do this by the installation of catch-basins, provided with half-traps at all necessary points along the thoroughfares. We now have about 160,000 of these catch-basins in the city of Chicago and we are endeavoring to clean them in a systematic manner. If we can do this, we shall have solved the problem of sewer cleaning to a major degree.

Most of these basins receive the street-wash through inlets and the rest through perforated lids on the basins. In my judgment, inlets should be superseded by the perforated lid practically universally. It would save incalculable sums, not alone in original cost, but in continuous upkeep. If inlets must be used, they should effectually keep from basins and main sewers all refuse, such as sticks, bottles, rags, etc.

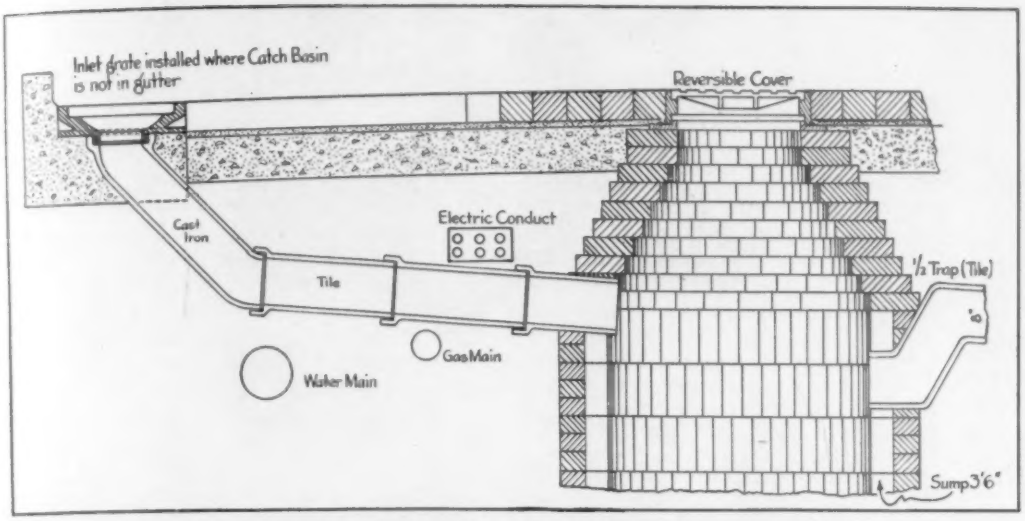
The practice of placing catch-basins in parkways inside the curb is not good or economical. Our experience teaches that all main sewers should be in the roadway.

During 1926, the Bureau of Sewers of Chicago cleaned over 70,000 catch-basins, approximately half by hand and half by the catch-basin cleaning machine known as the Auto Eductor. The basins cleaned by hand cost slightly over $4 per basin, and those cleaned by the Eductor slightly over $2 per basin. Two dollars is high for Eductor cleaning and should be much less in smaller cities where traffic conditions are not so congested or the hauls to dumps so long, and where two laborers can accomplish nearly the same results that three laborers do in our city working with the Eductor.



AUTO EDUCTOR USED BY CITY OF CHICAGO FOR CATCH-BASIN CLEANING

Our present fleet of seven machines is four years old and repairs are reflected in the increased cost of catch-basin cleaning. As these machines pay for their original cost within the first ten or eleven months they are in service, it is a source of wonder to me why practically all public catch-basin cleaning is not done with them. Of equal force with the saving as an argument in their favor is the sanitary reason. Our Eductor crews can and do clean basins block after block and leave on the street no visible trace of their work, whereas the hand



DETAIL OF CURB INLET AND MANHOLE OF TYPE USED IN CHICAGO

MANHOLE CURB REPLACEMENT IN CHICAGO

Upper left, a common sight in many cities—a worn-down and broken flange or lid seat on a manhole; Chicago is rapidly getting away from such conditions. Upper right, the expensive, dangerous job of ripping up the pavement to replace a manhole flange, which Chicago has done away with. Bottom, workman taking up a reversible flange or lid seat, preparatory to turning it over and putting it back. Note that the pavement is undisturbed. When completed, the work is like a new job

method leaves not only its mark, but often more pungent evidence that our crews have worked there.

Sewer Maintenance

Keeping catch-basins in order is the most important thing to do toward keeping our main sewers serviceable, because if we can keep our main sewers free from sand and gravel and dirt reinforced with oil, the sewers can be kept serviceable by mushing, followed by flushing. During the last two years we have been getting better results in main sewer work by the use of rotary knives which are drawn through the sewer for the purpose of breaking up sediment and churning the sewage into a mush that will respond to flushing.

In order to reduce the initial cost, most sewers are built too small to serve the contributing territory, consequently they are used to their full capacity at all times, especially during rainfall periods.

Not to have all the equipment necessary is very uneconomical. A sufficient number of Eductors, derricks, chains, buckets, rotary cutters, and the new steel floating rods and other minor tools, are necessary if sewer-cleaning laborers are to work to advantage.

The matter of sewer repairs is, of course, of equal importance with that of sewer cleaning. Practically every sewer repair job is an emergency one and, like a rip in clothing, it should be attended to as soon as it is possible to do the work.

Manhole Curb and Cover Replacements

Public officials, like those of private institutions, should be always anxious to remove causes of expense to the administration of their respective positions. Every possible improvement should be adopted and others sought. This policy is expected, even demanded, of executives in private business, and public executives should practice it. In practicing this policy the Bureau of Sewers of Chicago discovered that one of the greatest sources of expense in our sewer repair work was the replacement of catch-basins and manhole covers. We found that covers and curbs were subjects for the junk pile within 20 to 30 years, according to the traffic they were subjected to, that they became useless just as the flange upon which the lid rested had worn down a half-inch, and that they were a public nuisance and danger from that time until replaced.

There is no remedy for this condition, except replacement with new sewer curbs. In every instance where this has been done, we have found that we had to junk about 400 pounds of iron; that we had to pay the street department approximately $50 for street repairs made necessary by tearing up the pavement which held the curb or cover firm in its seat upon the manhole or catch-basin; and that it required the best part of a day for the repair crew, composed of one bricklayer, three laborers, and a small truck to take an old curb out and replace it with a new one.

I am glad to be able to report that this wasteful practice has been abolished in Chicago. We have replaced the old-fashioned one-piece curb with a two-piece reversible curb, which when its inner flange or lid seat wears down to become a nuisance or dangerous to vehicular traffic, can be reversed within 15 minutes without the slightest damage to the pavement, and which, when both inner flanges have been worn down, can be replaced with a new curb or ring, leaving the base upon which it rests upon the basin or manhole without in any way destroying the pavement, impeding traffic or wasting nearly a whole day in labor.

In addition, the reversible curbs or covers, on account of their design, are much stronger than the old single-piece curbs, and nearly 100 pounds is saved in the casting. Because of the two-piece feature, namely, the base and the ring, one laborer can handle them in any place, whereas it required the services of from two to three laborers to handle the one-piece curb covers. All our new sewers have the reversible curb, and all replacements of old curbs are made with them. They are cheaper and lighter and last twice as long.

Use of Salt in Catch-Basins

In severe weather, we experience some trouble with the freezing-up of catch-basin inlets. That is one of the reasons why I should like to see all catch-basin inlets done away with. When we note the frost coming on, we get ready to salt catch-basin inlets. We have never had to use steam as yet. Salt does the work, aided by men with rods who loosen up any ice and clean out the basins. With the combined sewer system in Chicago, there is a great deal of heat in the main sewer. The basins are only half-trapped. The sewage water practically never goes below 40 or 50 degrees in the main sewers.

MOTION PICTURES ON CHILD HEALTH

In addition to the three health films, "Our Children," "Well Born," and "Posture," listed on page 233 of the February issue of The American City, as available for loan or purchase from the Children's Bureau of the United States Department of Labor, one called "Sun-Babies" is available. This shows the effect of sun-baths in the prevention and cure of rickets. Information regarding all these films can be obtained from the Children's Bureau, Washington, D. C.

Some Relations Between Sewage Treatment and Water Purification

By Paul Hansen

Pearse, Greeley & Hansen, Hydraulic and Sanitary Engineers, Chicago

UNTIL the work of the International Joint Commission on the Pollution of Boundary Waters between the United States and Canada in 1912, no serious attempt had been made to formulate a measure of the relation between water purification and stream pollution control. The International Joint Commission established the colon bacillus index as a suitable unit of measure, and on the basis of experience gained in the study of boundary waters advanced tentatively a conclusion that raw water delivered to water purification works should not contain as a yearly average more than 500 colon bacilli per 100 c. c.

In 1921 and 1922, H. W. Streeter of the U. S. Public Health Service made a statistical study of the performance of twenty-five water purification plants in the Central West on the basis of data previously collected by Prof. J. J. Hinman and presented in the *Journal* of the American Water Works Association for September, 1918. These data were supplemented by more detailed information on the operation of two filter plants using Ohio River water. Streeter's studies brought out very definite average relations between bacterial content of raw and of filtered water, which he expressed in the form of diagrams and formulæ. On the basis of relations thus established, it appeared that the average efficiency of modern filter plants of the rapid sand type supplemented by chlorination is such that in order to obtain a purified water complying with the old U. S. Treasury standard for purity of drinking water on interstate carriers, namely, a colon bacillus content of 2 per 100 c.c., the raw water should not have an average colon bacillus content of more than 650 per 100 c.c.

In 1923, Streeter made elaborate comparative studies of the performance of ten filter plants taking water from the Ohio River and confirmed his former studies, showing a definite relation between raw water bacterial content and filtered water bacterial content. At the plants studied, however, chlorination of the filtered water was necessary to secure a final effluent that would meet the new Treasury standard when the raw waters contained colon bacilli to the extent of 100 per 100 c.c. and even less. Where chlorination was used, filter plants with double coagulation and double sedimentation could adequately purify waters containing as many as 10,000 colon bacilli per 100 c.c., while plants with single coagulation and sedimentation could successfully handle waters having slightly in excess of 1,000 colon bacilli per 100 c.c.

Current Conceptions

There has always existed among sanitary engineers a recognition of a relation between sewage treatment and water purification. The conceptions of this relation have for the most part been vague. Many have been inclined to emphasize water purification to the exclusion of sewage treatment in so far as sewage treatment relates to the protection of water-supplies. In the public mind, on the other hand, there has been a vague impression that sewage treatment will restore streams and lakes to a potable condition.

Meeting the U. S. Treasury Standard

In the light of these studies, the United States Public Health Service has indicated a content of 100 colon baccilli per 100 c.c. in the raw water as a maximum average limit where filtration without sterilization is employed. No change has been made in the tentative standard where sterilization is used. In the light of Streeter's studies, the number of colon bacilli in the raw water in the latter case might be increased somewhat to meet the old Treasury standard for drinking water on interstate carriers but should be kept about where it is to meet the new Treasury standard for drinking water which permits but one colon bacillus per 100 c.c.

Some question may be raised, and has been raised, as to the necessity of meeting the U. S. Treasury standards for drinking water to insure the safety of purified public water-supplies. On this point it is difficult to obtain conclusive evidence, epidemiological or otherwise. There is agreement that both the old and the new Treasury standards are none too severe as generally applicable analytical standards. There

is also agreement that if the Treasury standard is an obtainable one as well as a safe one, it should be accepted for purification practice in connection with public water-supplies. This is in line with the present-day tendency in sanitary matters, namely, a tendency to make standards higher and higher until a point is reached that will leave no room for doubt as to adequacy.

Accepting both the tentative standards for the limit of raw-water pollution and the new standard for purity of drinking water on interstate carriers, it is apparent that many streams and lakes, notably the Ohio River and the lower end of Lake Michigan, are polluted to a degree that will not admit of adequate purification with rapid sand filter plants of standard design even when supplemented by sterilization. Streeter's studies have revealed the difficult conditions on the Ohio River. To remedy this situation three things are possible:

1. Seek a supply less subject to pollution.
2. Elaborate the purification process by double coagulation, double sterilization, superchlorination, etc.
3. Relieve the burden of pollution by treatment or more adequate treatment of sewage discharged above water-works intakes.

New Water-Supplies

In this discussion no consideration will be given to the question of seeking new water-supplies, other than to state here that there may be many situations in which it would be cheaper and safer to seek another source of supply more readily purified or not requiring purification, than to depend on sewage treatment or upon elaboration of water purification processes.

Water Purification More Dependable

Broadly speaking, main dependence is, and should be, placed upon water purification rather than sewage treatment as a means of obtaining a safe public water-supply. Unless the water-works authorities control by ownership the entire drainage area contributing to a surface supply, the supply cannot be kept free from a degree of pollution that may be dangerous. It is therefore important to purify a water-supply, preferably by filtration and sterilization, even in cases where there is no continuous sewage pollution. Where there is continuous sewage pollution, even a high degree of sewage treatment will not insure the safety of water-supplies taken from points below, partly because it is rarely practicable to carry sewage treatment to a point that will insure a sterile condition of the sewage effluent and storm overflow, and partly because miscellaneous pollution from surface wash and occasional individuals and habitations cannot be entirely prevented. Therefore, it is obvious that the first necessary line of defense in maintaining the safe quality of a public water-supply is water purification. The only exception to this statement that comes to mind is the possibility of obtaining a pure water-supply from favorably located intakes on great fresh-water lakes, but even this possibility is rare, for the reason that the great lakes of the United States are so polluted by sewage from cities on their banks and from navigation that it is either impossible or prohibitively expensive to reach pure water by means of intakes. At the lower end of Lake Michigan intakes must extend into the lake at least ten miles to obtain pure water. On an annual cost basis, such long intakes cannot be justified as against one-mile intakes and filter plants, except in the case of very large tunnel intakes at least nine feet in diameter of not less than 130,000,000 gallons per day.

Sewage Treatment Reduces But Does Not Remove the Burden

From the foregoing it appears that sewage treatment by itself cannot be regarded, under any circumstances likely to be encountered in practice, as an adequate means for protecting a public water-supply. It can be regarded, so far as water-supplies are concerned, only as a means for reducing the burden upon water purification plants used in connection with water-supplies in a down-stream direction or within an affected area on lakes. Furthermore, even if sewage treatment did constitute a substitute for water purification, it would still be too costly to use as a means for full protection of public water-supplies. Complete sewage treatment of the type capable of producing a clear, non-putrescible effluent, relatively free from bacteria, and which might be readily sterilized, would cost not less than $10 per capita, and the total annual charges would not be less than 95 cents per capita. This cost, however, does not take into consideration necessary intercepting sewers for conveying sewage to sewage treatment plants. Such sewers must nearly always be built in connection with sewage treatment projects, as existing outlets are rarely located near sites suitable for treatment works. Such intercepting sewers vary greatly in cost and may range all the way from one to two dollars per capita up to ten dollars or more per capita. Water filtration plants in connection with public water-supplies, on the other hand, rarely cost more than five dollars per capita, and the total annual cost rarely exceeds eighty cents per capita.

Economic Balance Between Water Purification and Sewage Treatment

We may now consider a possible economic balance between water purification and sewage treatment. In the ordinary case, however, there is little opportunity to consider such a balance. A city taking its water-supply from a polluted stream is generally forced to elaborate its water purification works until the raw water becomes so polluted that it places an undue burden upon the water purification works, and then in all likelihood must seek a new source of supply before it can in the ordinary course of events receive relief by purification of sewage from cities in an up-stream direction. An up-stream city rarely becomes so altruistic as to undertake sewage purification for the protection of the water-supply of the down-stream city until forced to do so as a result of damage suits or as a result of action on the part of state authority.

An illustration of a situation of this sort is afforded by the city of Albany, N. Y., which has repeatedly elaborated its water purification works to take care of increasing pollution entering the river at Troy and other points above. The first installation at Albany, completed in 1902, comprised slow sand filters with preliminary sedimentation. Later, preliminary roughing filters were installed. At a still later period these roughing filters were converted into rapid sand filters of standard type, and at the present time the treatment comprises aeration, coagulation, sedimentation, rapid sand filtration, slow sand filtration, and double chlorination. Even so, the burden upon the treatment works is too great, and, moreover, the esthetic sense of the community rebels against the use of such highly polluted water, however much purified. The city now has under consideration the development of a costly new water-supply from streams less subject to pollution than is the Hudson River.

Value of Conservancy Districts

It is conceivable that cities along the same stream might group themselves together for the purpose of coordinating and combining their water-supply and sewage disposal problems. The machinery for such an arrangement now exists in the state of Illinois in the form of a Conservancy District Act. One such district has been formed, namely, the Fox River Conservancy District, but the activities of this district are directed at the prevention of undue pollution of Fox River by sewage primarily to prevent nuisance and to protect fish life, because none of the cities along the river draws its water-supply from the river at the present time, nor is any city along the river likely to do so in the future.

The only cities at present which are in a position to consider an economical balance between water purification and sewage treatment are those located on the Great Lakes and using the lakes both for water-supply and for receiving sewage. Such cities pollute their own water-supply and have an opportunity to consider whether they may safeguard the water-supply by water purification, by sewage treatment, or by an economical arrangement of both. Even in such cases, there is little doubt, as already noted, that the maximum of health protection can be gained through water purification, even though the water purification works are elaborated to the point of including aeration, double coagulation, double sedimentation, double filtration, and superchlorination or double chlorination. A plant of such elaboration is not likely to cost more than $10 per capita for installation, and operating costs will compare favorably with those of complete sewage treatment. Sewage treatment is more apt to be undertaken by a city as a result of nuisance conditions, pollution of bathing beaches or esthetic considerations than as a means for protecting its water-supply.

Examples of Economic Balance

The writer's firm had to consider the protection of water-works intakes at Portsmouth, Ohio, and in various communities comprising the North Shore Sanitary District. In these cases local conditions have indicated that sewage treatment comprising sedimentation followed by chlorination represents the economic maximum to which sewage treatment is warranted at the present time. At Portsmouth a portion of the city known as Sciotoville, having a population of about 3,000, lies so far up-stream from the main portion of the city that it would have been extremely costly to convey the sewage from this community into the main intercepting sewers. The water-works intake of the city is about two miles down-stream from Sciotoville. Treatment works at Sciotoville comprise Imhoff tanks, contact tanks, and liquid chlorine for disinfecting the effluent.

In the North Shore Sanitary District the question of protection of bathing beaches is regarded as even more of a factor in determining the degree and character of sewage treatment than were the water-supply intakes.

At Springfield, Ill., there are under construction intercepting sewers along the east and west margins of the city for collecting sewage and delivering it to a site northwest of the city for treatment. There is also under consideration a water-impounding project including a

large lake northeasterly of the city. The east side intercepting sewer, therefore, had to be planned with reference to the protection of this lake as a city water-supply. All the Springfield sewers are on the combined plan. It was deemed economical and satisfactory to intercept from the existing combined sewers draining to the future reservoir site all sewage up to a rate of 2,125 gallons per capita per 24 hours, based upon the future estimated population. The first 300 gallons per capita of this amount will be pumped to the main sewage treatment works and out of the drainage area of the proposed future water-supply. The remaining sewage over and above 300 gallons per capita will be discharged into the head waters of the future reservoir some 11 miles above the proposed point of intake, and provision will be made for its chlorination at such time as the new water-supply is developed.

Degree of Pollution Permissible

The degree of pollution in a raw water which will offend the esthetic sense or which may be regarded as beyond the degree of pollution which any practicable water purification installation can handle, is difficult to fix. It is likely to be different in different places and is likely to vary from time to time. It is probably less, however, than that degree of pollution which is plainly perceptible to the unaided senses or which will destroy fish life.

Using Streeter's work as a guide to judgment, it is probable that a raw water will be regarded as offensive when it contains a colon bacillus content of 50,000 per 100 c.c. or over. While waters of this degree of pollution can hardly be recommended by engineers, they can, nevertheless, be effectively handled by water purification works of an elaborate type.

The question remaining is: Shall we countenance greater pollution in raw water than the present tentative standards of the United States Public Health Service permit and meet this greater pollution by adequate purification works, and if so, how far shall we go in this direction?

The present status of our ideas on the relation of stream pollution control and water purification may be summed up about as follows:

1. Because streams and other bodies of water with populations on their watersheds cannot be so maintained as to be safely potable, water-supplies taken from them must be purified in any event. There are very few exceptions to this rule.

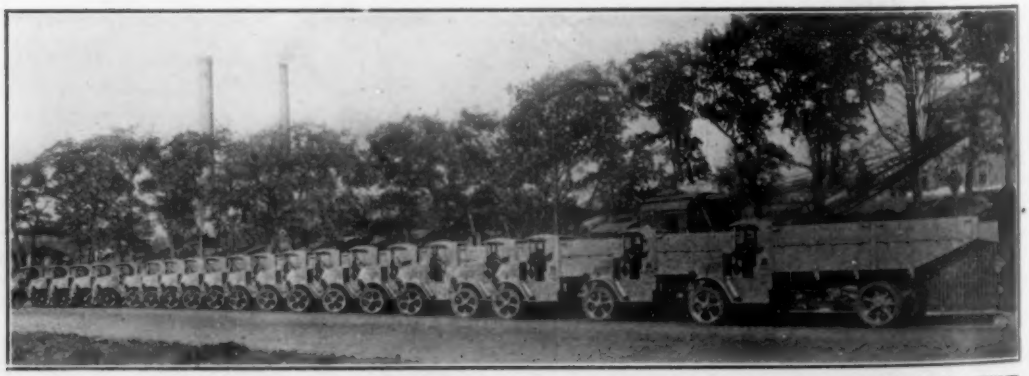
2. Cities discharging sewage into streams used at points below as sources of public water-supply may in many cases be required to purify their sewage to a degree that will not place too great a burden on water purification works, which is now tentatively measured by an average colon bacillus content not in excess of 500 per 100 c.c. In some cases it is conceivable that this degree of sewage treatment may be impracticable or unreasonable, in which case the water must not be used for water-supplies, or more elaborate water purification must be installed.

3. Opinion on the desirability of more water purification to meet more stream pollution than permitted by present tentative standards is not crystallized, and the subject merits further investigation and study.

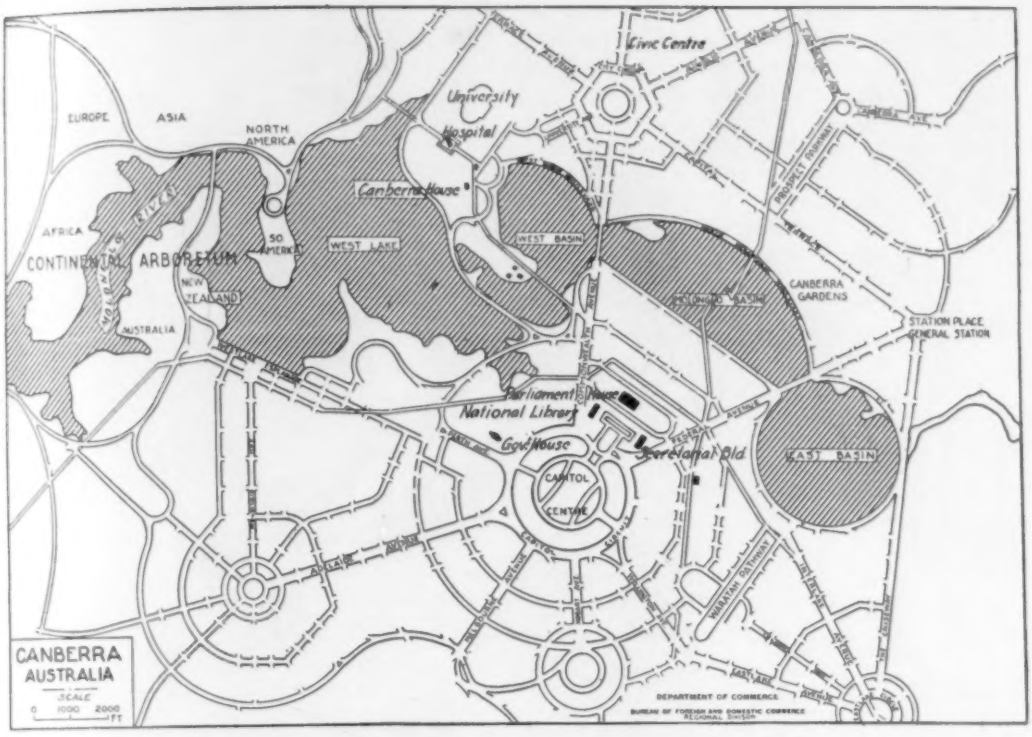
4. Aside from uses of streams and other bodies of water as sources of public water-supply, there should be maintained that degree of stream pollution control that will prevent them from becoming unsightly and malodorous and destructive of fish life.

ACKNOWLEDGMENT.—From a paper read before the Indiana Section, American Water Works Association.

Boston's Fleet of Snow-Fighting Trucks



A PORTION OF BOSTON'S FLEET OF SIXTY MACK TRUCKS WITH 14-CUBIC-YARD BODIES FOR SNOW FIGHTING



Australia's New Federal Capital Formally Opened

CANBERRA, the new federal capital of Australia, is rising out of a once barren waste, 209 miles southwest of Sydney and 75 miles from the east coast. The plan for the city was adopted after a world-wide competition, in 1912, in which the winner of the first prize was Walter Burley Griffin, of Chicago.* Work was begun on the plan not long after its acceptance, but was interrupted by the war and various difficulties, legislative and otherwise. However, Canberra has progressed sufficiently to have celebrated the dedication of the Parliament Building and the formal opening of the capital by the Duke and Duchess of York on May 9.

When the foundation stones of the new capitol were laid, with appropriate ceremonies, in March, 1913, according to an article by Lillian G. Knowles, Division of Regional Information of the U. S. Department of Commerce, in *Commerce Reports*, for April 4, 1927, about 5,000 people gathered by horse and buggy to witness the ceremony; while for the dedication this year it is estimated that 50,000 automobiles will bring visitors from all parts of the Commonwealth, and hotels as far from the scene as sixty miles are being rapidly booked up.

As yet, it is stated, the new capital bears little resemblance to a modern city, approximately one-half of the population of 6,000 consisting of temporary laborers, artisans, and others engaged in preparing the city for its official duties. Building operations are being pushed rapidly, however, and in anticipation of the inaugural crowds it is proposed to erect a huge canvas town as an emergency shelter for visitors to the formal opening.

Garden City Type of Development

The total area of the Federal Territory of Canberra approximates 900 square miles. An area of 12 square miles is set apart for the site of the city proper, with further reservations of 100,000 acres for parks, boulevards, and roads, an extensive arboretum, etc.

The wisdom of the Australian Parliament in appointing, in 1920, the Federal Capital Advisory Committee of five engineers, architects and town planners, has been proved by the

* See THE AMERICAN CITY, July, 1912, page 9.

work that has been accomplished in meeting existing conditions without sacrificing the original plan. At present Canberra is of the garden city type. The public works that have been completed are not all in conformity to the ultimate needs of the city, for which, nevertheless, adequate plans will be followed. A commission of three now controls the administration and further construction of the capital. The government buildings are temporary and in a temporary location, but some of the important public works are permanently placed. In all these matters far-sightedness has been shown and professional ability of a high order on the part of the Advisory Committee. It is stated that good roads have been laid for miles around, and sewerage, water, and lighting systems are for the most part ready for use. Many of the main avenues will have park areas through the center. There are no street cars nor overhead wires within the city limits. Transportation is to be provided by busses operated by the Federal Capital Commission.

Strict Control of Food and Traffic

All food to be consumed in Canberra will be under strict supervision. An expert from New Zealand, who recently reported on a system of municipal control of milk for Melbourne, has been engaged upon a similar investigation at Canberra. An abattoir for the whole of the territory has been located five miles from the city. No meat will be allowed to be used in the territory unless killed at this abattoir, and a rigid tubercular test of all dairy cows will be made.

Attention has also been given to traffic regulation. The motor-traffic ordinances for Canberra, which were put into effect in February this year, are said to constitute the most up-to-date code of traffic laws now in force in Australia. Provisions have been made for the issuance of licenses, limiting the age of operators of motorcycles to over sixteen years, and that of drivers of motor vehicles to over seventeen. Drivers of motor busses are required to be twenty-one years or over.

The final report of the Advisory Committee has been filed and the Committee has been discharged and the report printed. It gives detailed information about the construction and cost of the public works, and about industrial plans, housing and recreational facilities, the civic center, the zoning regulations, the financial and land policies, forestry, etc. An immense amount of detail work has been involved in the accomplishments of the Committee, and the report gives valuable information as to the investigations made and the reasons for the decisions that were reached in the four years' period of active construction. The initial romance of this created city will be felt throughout its entire future growth and development.

Canberra—A Land-Value City

Under this heading, *Land and Liberty* (London) quotes, in its issue of January, 1927, the following items from two Australian papers:

Under the City Area Leases Ordinance, 1924-25, it is not possible to secure a freehold title in Canberra. . . . It is interesting to study the conditions of sale. All leases are for 99 years. The annual rent of a block shall be for the first 20 years, £5 per centum of the amount bid by the successful bidder, and thereafter £5 per centum of the unimproved value of the block after each reappraisement thereof, as provided for, viz., each ten years. It will thus be seen that the Commonwealth Bank, having bid £5,600 for its block, will have to pay £280 ground rent each year into the Treasury. . . . In connection with the residential areas, the conditions provide that the minimum cost of the building to be erected on the land shall be £1,000 in South Ainslie, £1,200 in Telopea Park, and £1,500 in Blandfordia. The lessee must commence the erection of the building within one year from the commencement of the lease. . . .

"The freehold title to land remains subject to the payment of the annual ground rent and the holder of the title has the right for all time to sell the improvements at the best market price obtainable. The reappraisements periods at Canberra are in our opinion, too lengthy. We should have preferred to have seen the first period set at ten years, with fresh valuations thereafter every five years. However, the system in operation is a big step in the direction of conserving community-created land values for the benefit of the community, and its successful application at Canberra is a valuable object lesson for the whole world.

—(From *Progress,* Melbourne.)

According to the Chief Federal Capital Commissioner (Mr. J. H. Butters) the rise in land values in and around Canberra is such already that it is inevitable that Canberra will within 25 years be returning sufficient revenue to pay interest on the whole of the Commonwealth's investment in the capital city. This statement, which he has made on other occasions, and which has evoked vigorous protests from public servants, Mr. Butters repeated with greater emphasis last night at the Queen's Hall, Collins Street, where he delivered, under the auspices of the Royal Victorian Institute of Architects, an illustrated address on "The Progress of Canberra." Mr. Butters said that the position from the taxpayers' point of view was very satisfactory. The Commission was making no attempt to force the capital to pay for itself in this manner, as circumstances were themselves bringing this about.

—*The Argus,* November 4, 1926.

EDITORIAL NOTE.—In *The Atlantic Monthly* for April appears an article by John Reay Watson, an editor and journalist of long standing, and a resident of Melbourne, Australia, on "Building a Model City." This gives, in ten pages, an interesting account of the building of Canberra, of present conditions there, and of plans for the development and administration of the new Australian capital.

A VIEW OF CANBERRA, THE NEW FEDERAL CAPITAL OF AUSTRALIA, WHICH PROMISES TO BE ONE OF THE GREAT CITIES OF THE WORLD, SHOWING THE PARLIAMENT HOUSE, NOW NEARING COMPLETION

Wide World Photos

THE CIVIC PLACE, ONE OF THE GREAT OPEN SPACES OF CANBERRA, WITH THE LAYOUT OF THE SURROUNDING AVENUES

Abating the Dust Nuisance on Public Streets and Alleys

Prepared from a Report of the Municipal Reference Library, Chicago, Ill.

IN an endeavor to secure information for the use of the city officials of Chicago, Honorable Robert E. Barbee, Alderman, Seventeenth Ward, Chicago City Council, requested Frederick Rex, Municipal Reference Librarian of Chicago, to prepare a report on methods employed in larger cities in preventing or abating the dust nuisance on public streets and alleys. We are privileged to abstract this report for the benefit of readers of THE AMERICAN CITY, as it contains much helpful information.

Baltimore, Md.

Steuart Purcell, Highways Engineer, Bureau of Highways, Department of Public Works, Baltimore, reported that two materials were used for the abatement of dust in Baltimore, namely, granulated calcium chloride and fuel oil of 28 to 32 Baume gravity. Before applying the calcium chloride, the road surface is thoroughly wetted and the chloride is then applied at the rate of from ½- to 1 pound per square yard, depending upon the condition of the road. The cost of this treatment, including the preliminary sprinkling, is approximately 3 cents per square yard.

When fuel oil is used, it is applied at the rate of ⅓- to ½-gallon per square yard, and the cost is from 3 to 5 cents per square yard. No other materials have been used for this purpose in Baltimore, and no complaints of any kind have been received. Usually one treatment is sufficient for the season.

Boston, Mass.

Thomas J. Watson, General Foreman, Street Oiling Service, Public Works Department, reported that the city of Boston yearly treats approximately 2,750,000 square yards of macadam streets with 45 and 65 per cent asphaltic road oil for the prevention of dust. The 45 per cent asphaltic road oil has demonstrated that it is the one best suited for the work, as it can be applied without heating and will penetrate readily, besides having sufficient asphalt content to make an excellent mat when covered with sand, providing also a satisfactory riding and waterproof surface. It is a powerful agent in combating the dust nuisance.

This oil is applied by pressure distributors furnished by the contractor who supplies the oil. The contract price for the 1926 season was 6.69 cents per gallon applied. The sanding is done by city forces from trucks owned by the contractors that supply the sand. About 35 pounds of sand is used per gallon of oil.

On the hill streets, 65 per cent asphaltic road oil is used. This is heated when applied by pressure distributors, and a coarser sand is used in covering. To prevent bleeding, a heavier blanket of sand is used than with the 45 per cent asphaltic road oil. Since 1920 only one carload of non-asphaltic oil has been used on the streets of Boston.

Calcium chloride is used in the late fall and the early spring where openings have been made. This is supplied dry, and about two pounds to the square yard is used. It is satisfactory in keeping the dust down until such time as permanent repairs can be made.

Buffalo, N. Y.

Buffalo has a total of about 700 miles of streets in the city, over 500 miles of which are paved. The remainder of the streets exist either only on paper or are not built up, so that there is very little complaint regarding dust. On many of the macadam streets a Tarvia-B dressing is used, penetration method, the Tarvia being covered with a seal coating of stone chips.

Los Angeles, Calif.

The usual kind of road oil used in Los Angeles on street work is what is known as 81 per cent oil, meaning that it contains 81 per cent or more of asphalt. Specifications for this oil are found in Sections 25, 60, and 101 of the Standard Specifications No. 129—New Series, of the Engineering Department of the city of Los Angeles. Oils containing a lesser percentage of asphalt are found to be less desirable. For some special jobs 90 per cent road oil is used.

Minneapolis, Minn.

Minneapolis has not used any tar for dust prevention. It has used in the last few years an asphaltic oil which serves two purposes, (1) to lay the dust, and (2) to build up a mat coat on the roads. E. R. Dutton, Assistant City Engineer, reported that they have had some little difficulty with the tracking of oil into houses and onto rugs, but there is no difficulty in regard to odor. In 1924, 2,088,651 gallons of oil were purchased at a price of 6.11 cents per gallon. That year a total of $157,473.39 was expended and 21,769,333 square yards of roads

were oiled with one application. On some streets as many as five applications of oil are used during the season. This made the average cost per square yard for one application 0.72 cents.

Newark, N. J.

George W. Andress, of the Bureau of Streets, Newark, reports that an asphaltic road oil containing approximately 35 per cent asphalt is used for dust laying. The cost of this oil applied to the street is 11.1 cents per gallon. They have used non-asphaltic oil for this purpose, but have found from experience that the asphaltic oil gives more lasting results.

New Orleans, La.

M. V. Haulard, Superintendent, Municipal Repair Plant, New Orleans, reports that not very much is done toward the abatement of the dust nuisance on shell and gravel streets. A number of streets have been treated with a 70 per cent asphalt oil and this has proved satisfactory as far as elimination of dust is concerned, but it has not been satisfactory from a maintenance standpoint, as the application of such material prevents the use of a grader, and serious defects soon develop that can be corrected only by the use of a scarifier. A lighter waste automobile or pit oil is now being tried but has not been used for a sufficient length of time to give definite results. Asphalt streets are generally flushed with water, so that no trouble is experienced with dust.

New York City

Joseph Johnson, Commissioner of Public Works, Borough of Manhattan, New York, reported that on unpaved streets in Manhattan a crude oil with an asphaltic base is used, being distributed over the surface from sprinkling trucks. This is a petroleum oil from which very light fractions have been removed. If this oil is tracked onto carpets, some damage is done, but there is no evidence of damage to rubber tires. Tar oils are to be preferred for use on macadam streets, but are not so suitable for earth roads as is the crude petroleum oil.

John B. Binzen, Engineer of Maintenance, Department of Public Works, Borough of the Bronx, New York, reports that a road oil is used on earth roads as a dust layer each year, and tar on macadam roads. It is the practice to coat the earth roads and the macadam roads once each year.

The oil for use on earth roads cost 6.7 cents a gallon delivered in tank-cars at railroad sidings, in 1926. The tar for macadam roads cost 10.9 cents per gallon delivered in tank-cars at railroad sidings, New York.

Philadelphia, Pa.

J. H. Neeson, Chief, Bureau of Highways, Philadelphia, reported that all paved streets are cleaned by the Bureau of Street Cleaning. The method used is to brush and haul away the larger particles of dirt and débris, and in the central sections, after brooming, the streets are flushed with water by large auto flushers.

The macadam paved streets, which are mostly in the outlying sections, are given a bituminous treatment, usually every other year, but in some cases every year. This treatment serves two purposes, namely, road preservation and dust prevention. The best grades of tars and asphalts are used for this work. The specifications for this class of material are open, permitting any of the better grades of tars and asphalts as furnished by the large refining companies. The material is contracted for and applied on the street. With the modern pressure distributors of the large refineries, little trouble is experienced with this work. The application of this class of material is covered with one of the various types of covering materials such as torpedo gravel, slag chips, or stone chips. Very few complaints are received, on account of the fact that the bituminous material is well blotted with covering material at the end of each day's application to take up the excess liquid.

The bituminous materials in this class are usually contracted for in large quantities, that is, 100,000 gallons or more, and the price of 1926 averaged 13 cents per gallon applied anywhere in the city limits. The average cost per square yard with covering material, using 20 to 25 pounds of chips, applied by city forces is 7½ cents per square yard.

In the case of unimproved streets, such as dirt roads and cinder roads, a lighter and cheaper class of oil is applied. An application of 1/5-gallon per square yard is usually made. One application may not last throughout the season, but it has been found better to use the second application than put the material down any heavier. This class of material in large quantities costs about 8 cents per gallon applied.

Some inconvenience is naturally caused, as would be the case in any kind of maintenance work on streets or roads. The effect, however, is hardly noticeable; it may be considered negligible if we eliminate the perpetual critics who can see no good in anything. Any person exercising care in the use of the streets so treated for 24 hours has no fault to find with the manner in which the work is conducted.

St. Louis, Mo.

J. H. Leek, Superintendent, Municipal Asphalt Plant, St. Louis, reported that road oil should be applied hot at a temperature of about 250 degrees Fahrenheit. No crude oil or tars are used in St. Louis. The best time to oil a dusty road is after a heavy rain when the surface seems dry, but is still moist underneath. This should be repeated two or three days later, even though the method is quite expensive.

Washington, D. C.

C. B. Hunt, Engineer of Highways of the District of Columbia, reported that the system of dust prevention used in the District of Columbia depends upon the character of the surface to be treated. For the better class of macadam roads a treatment of the surface which renders it dustless is given by the application of a light tar or heavy petroleum oil at a temperature of about 100 degrees and covered with stone chips or gravel.

For unimproved streets which are in use, a very light petroleum oil with small asphalt content is used to lay the dust. This is quickly absorbed by such a surface and requires no covering.

In both cases the materials are purchased under specifications of the United States Office of Public Roads. Crude oil or unrefined tar is not used.

There is little complaint received because of the character of the oil or tar, although it is quite certain that the heavier oil or tar can be tracked into a house and will result in damage to rugs. Every effort is made to prevent this by covering it promptly.

Screening Sewage to Protect Bathing Beaches

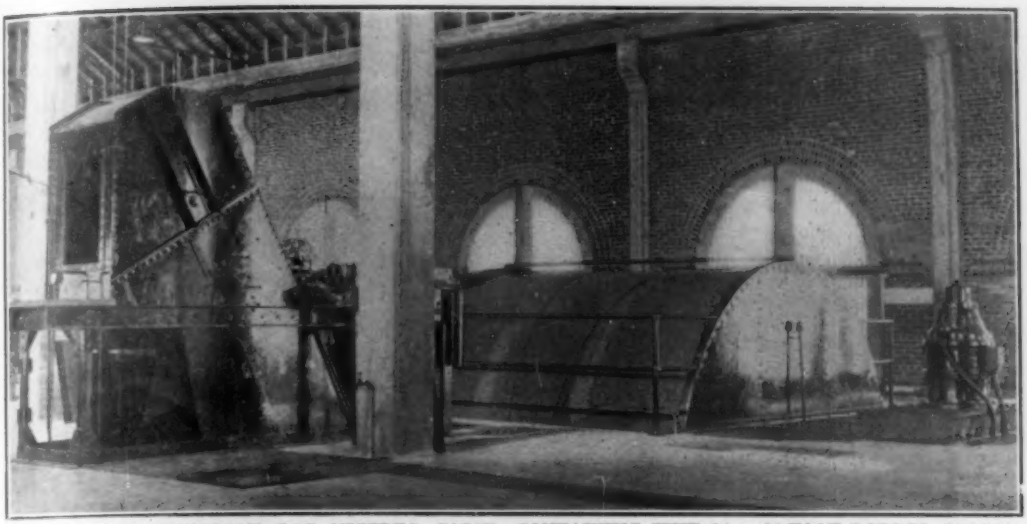
By Edmund B. Besselievre

THE recent reports of the Legislative Committee to investigate pollution of New York State waterways has again brought the question of stream and beach pollution into the spotlight of the daily press. The report held that a large part of the waters around New York are unfit for bathing, and gave several recommendations as to how conditions could be bettered.

The *National Municipal Review* in a recent editorial stated: "What we are going to say is a little far-fetched, but it gets to the point eventually. Not long ago 'Freckles' Devine, a 6-year-old boy of Philadelphia, swam across the Hudson River from the foot of 136th Street in 35 minutes. It is not the time it took this youngster to swim across that is the important thing, for some grown-up had made the same crossing in seven minutes' less time, but it was what he was heard to ask on the way over when a wave slapped him in the face and he swallowed a mouthful of water, 'What the hell do you think of people who will live along a river that tastes like this?'."

It is not only in New York that this question of pollution is a serious one. From Maine to Miami, from San Diego to Seattle, from Tampa to Tampico, our coasts are dotted with famous watering places that depend almost entirely on their beaches as the magnet to draw the influx of pleasure-seeking visitors with its consequent financial harvest for the residents.

CHELSEA HEIGHTS SCREENING PLANT, ATLANTIC CITY, N. J., IN WHICH ONE 8 x 3-FOOT DORRCO SCREEN IS INSTALLED



NORTH PLANT, HYPERION, LOS ANGELES, CALIF., CONTAINING FIVE 14 x 20-FOOT DORRCO SCREEN UNITS

In the South Hyperion plant, eight 8 x 8-foot units are installed

Many of these resorts spend a great deal of money in advertising their natural advantages of location, and it is seldom indeed that the bathing beach is not featured in their advertisements. Now the danger of beach pollution is threatening practically all of our coastal cities, and visitors will not flock to those resorts that are not far-sighted enough to take preventive measures to overcome the difficulty. Apart from the natural disinclination to bathe in water containing visual evidence of sewage pollution, there is the menace to health itself.

As a consequence of this state of affairs, several cities have investigated the problem of eliminating pollution, and it has been proved entirely feasible and relatively inexpensive for seacoast towns to prevent pollution of their own and neighboring beaches by sewage or other wastes. The polluting solids that cause the complaints of bathers and the disfigurement of the beaches are practically all of such size as to render them easily removable by mechanical means. Mechanical fine screening has been developed to a point where a city can install such means of treatment and be certain that complaints will cease. The buildings housing screening plants can be attractive in appearance and the plant may be odorless and quiet in operation, and never betray its presence or purpose to the passerby.

Cost of installation of efficient types of mechanical fine screens are surprisingly moderate and the upkeep and running charges remarkably low. The solids removed by the screens are held mechanically and placed directly in cans or other receptacles for hauling away or, as in many of the most modern plants, are conveyed by compressed air to the point of final disposal.

In cities where an incinerator for the garbage is available, the problem of screenings disposal is a minor one. Screenings are drained of the excess water while being removed from the screen unit and may then be mixed directly with the garbage and consumed. In places where an incinerator is lacking, the screenings may be buried in adjacent fields or farms.

Among the famous bathing places that have solved their pollution problem by fine screening are Atlantic City, N. J., Palm Beach and St. Petersburg, Fla., Hyperion, Los Angeles, Santa Barbara and Long Beach, Calif.

Reduced Cost of Operation of Water Department in Mason City, Iowa

PRIOR to 1921, the City Water Department of Mason City, Iowa, had for twenty years been showing an annual average deficit of $20,000. During that period it was necessary to float bond issues amounting to $422,000 with which to rehabilitate the system and keep it up to requirements.

In 1922, the daily pumpage of the system was in excess of three million gallons per day, and in spite of the fact that the consumers of city water have increased approximately 20 per cent since that time, the daily pumpage has been reduced to about one and a quarter million gallons per day through more economic methods of plant operation and the elimination of many losses through leaks and breaks. This has effected a reduction in operatio nand fuel costs of approximately 67 per cent.

During the last five years this department of the city, instead of showing a deficit, as it did prior to 1921, has shown a profit of approximately $40,000 each year, and this without any increase in water-rates. E. H. Crofoot is Manager of the Water Department.

PRESENT WATER-WORKS OF THE VILLAGE OF NYACK, N. Y., LOOKING ACROSS THE OLD SLOW SAND FILTERS

Recent Improvements in the Water-Supply of Nyack, N. Y.

By Nicholas S. Hill, Jr.

Consulting Engineer, New York City

THE village of Nyack has recently completed and placed in operation a mechanical filtration plant having a normal capacity of 1,500,000 gallons per 24 hours, to replace an inadequate plant of the slow sand type, and has made additions and changes in the pumping-station equipment, substituting electrical for steam power.

Nyack is situated 28 miles north of New York City on the westerly bank of the Hudson River. The population as given by the 1920 census was 4,444. The water-works system serves a population of about 7,000, including the village of Nyack and the adjacent villages of Upper and South Nyack. The average consumption in 1924 was approximately 800,000 gallons per day.

The water is obtained chiefly from the Hackensack River at West Nyack. The point of intake and the construction herein described are located a few hundred feet north of the West Nyack station of the West Shore Railroad. The river above this point has a tributary drainage area of about 30 square miles. There is more or less direct and indirect pollution from the rural population and from the villages of New City and Congers, and the water is discolored by organic matter from swamp areas. These conditions make it unsuitable for drinking without filtration.

In 1897, when the village took over the water-works from a private company, measures were taken to improve the quality of the supply, which was then taken directly from the river without treatment. As a result of investigation, and upon recommendation of Allen Hazen, the village constructed a slow sand filter plant and pumping-station at the present site, and this plant was in service until the recent improvements were completed. A description of the original installation is given by G. N. Houston, in the Transactions of the American Society of Civil Engineers, Volume XLV, page 476. This article and the discussions which followed, describing the difficulties encountered from bad foundation conditions and a poorly equipped contractor, will be found interesting by anyone having a similar problem.

The Old Plant

In the old plant, water was led by gravity from the river to an inlet gate chamber through a 12-inch pipe provided with a balanced float valve. Originally there was a small intake and screen chamber at the river-bank, but this was put out of service by ice action and never repaired. The water passed from the inlet chamber to uncovered slow sand filters, which were constructed in two units, having a total area of 0.38 of an acre. The depth of water above the surface of the sand varied from 1½ to 3 feet, depending upon the stage of the river.

After passing through 3 feet of sand and 12 inches of graded gravel, the filtered water was collected in 6-inch open-jointed vitrified pipe placed 12 feet center to center on an 8-inch concrete floor. The collecting pipes discharged into a 15-inch tile drain leading to a

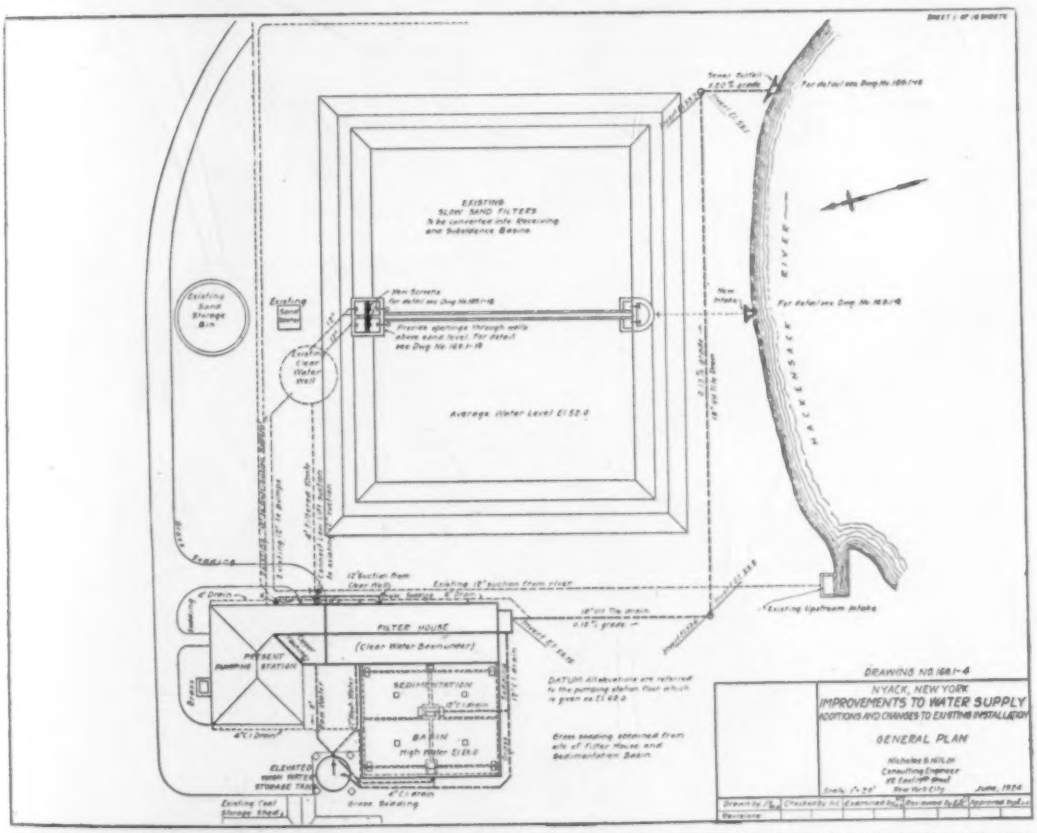
control chamber from which the water flowed to a small filtered-water well of about 35,000 gallons capacity. It was pumped from this point into the system, after treatment with liquid chlorine. A storage reservoir of 836,000 gallons capacity, on the distribution system, permitted some flexibility in the operation of the supply works.

The one-story brick pumping-station, about 40 x 50 feet in plan, housed two boilers, one of the return tubular type of 85 h.p., and the other a water-tube boiler of 125 h.p. There were two pumps, one a Worthington horizontal triple expansion, direct-acting, duplex pumping-engine, and the other a direct-connected motor-driven Goulds centrifugal pump, each of 1.5 million gallons daily capacity. The dynamic head against which the pumps operated when pumping at a rate of 1.5 million gallons per day was 170 pounds. In 1924 the pumps worked intermittently about sixteen hours daily to supply the consumption of 800,000 gallons.

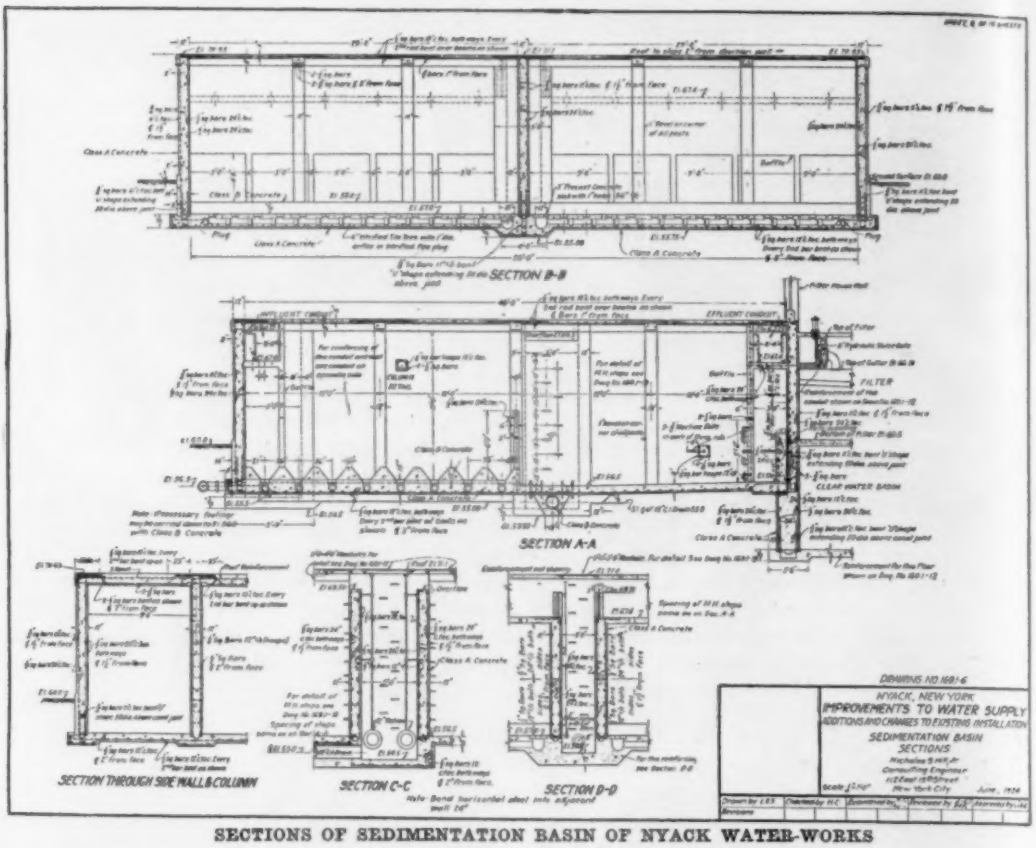
The gradually increasing growth in population and the resulting increase in the load on the slow sand filters, together with the difficulty of operating, cleaning, and repairing them because of leakage through the division wall and under the floor and around gates, seriously impaired the efficiency of the plant, and at the time the present improvements were undertaken a restricted quantity of water but little better in quality than that in the river was being delivered to the system. Relief from this condition had become imperative. The author, who was familiar with the existing conditions through the connection of his laboratory with the sanitary control of the supply, was requested to advise the village as to the best means of improving the quality of the water and increasing the capacity of the plant.

Studies for Prospective Improvement

The slow sand method of treatment then in use had many advantages. Water flowed through the filters by gravity from the river to the high-lift pumps, and no chemical treatment other than chlorination was used. Therefore, studies were made of the possibility of improving the existing plant and constructing additional units of the same type as those then in service. Past experience with the operation had shown the desirability of preliminary sedi-



GENERAL PLAN OF IMPROVEMENTS TO NYACK WATER-SUPPLY, SHOWING NEW FILTRATION PLANT AND OLD SLOW SAND FILTERS WHICH HAVE BEEN CONVERTED INTO RECEIVING AND SUBSIDENCE BASINS



SECTIONS OF SEDIMENTATION BASIN OF NYACK WATER-WORKS

mentation of the river water. Some means of automatic control of the rate of flow through the filters was also desirable in order that the load might be kept as nearly uniform as possible.

The leakage under the floor and through the division wall between the two filters had become so great as to make it necessary to shut off both while cleaning. For this reason, considerable work under extremely difficult conditions would have been required to bring the existing plant into satisfactory condition. The probable difficulty and expense incident to the construction of additional filter units were also apparent from the records of construction of the original plant. Taking all of these factors into consideration, a careful estimate indicated that an entirely new plant, using rapid or mechanical filters, could be constructed for about 60 per cent of the cost of rehabilitating the old filters and adding new units, and that this saving in cost of installation was not offset by the increased operating costs of the mechanical filters. Therefore, upon the author's recommendation, the recent construction was undertaken.

The New Plant

The new filter plant consists of a coagulating basin of 250,000 gallons capacity, giving a four-hour period of retention when operating at a rate of 1.5 million gallons per day, four mechanical filter units having a total capacity of 1.5 million gallons per 24 hours when operating at a rate of 125 million gallons daily per acre, and a filtered-water well of 63,000 gallons capacity, together with all necessary appurtenances for chemical treatment. Changes have been made in the control chamber of the old slow sand filter plant so that the river water will flow over these filters by gravity to the old suction well which is now used as the source of supply of the new low-lift pumps. This method of operation takes cognizance of the existence of the old filter construction and permits it to be used for preliminary sedimentation. Provision has been made for taking water directly from the river to the low-lift pumps when the preliminary sedimentation basins are out of service for cleaning.

The coagulating basin is covered with a concrete roof and divided into two independent units to facilitate operation and permit cleaning. The removal of a large proportion of the

sludge can be accomplished during regular operation without dewatering. This is provided for by ridge and valley construction in the floor over the inlet half of each unit. One-inch orifices placed 2 feet center to center in the valleys permit the sludge to enter 6-inch vitrified pipe collectors placed in the concrete floor in lines 3 feet apart. The flow of sludge is controlled by gates placed at the outlet end of the main collector, into which the 6-inch pipes discharge. This construction has proved very successful in several installations designed and constructed by the author. Connections to the pressure water-supply are provided at the outlet ends of each unit for use in flushing by hose when thorough cleaning is desirable.

Each of the four filter units are 10 x 14 feet in plan. The filtering material consists of 30 inches of sand having an effective size of approximately 0.45 millimeters and a uniformity coefficient of 1.44. The sand is placed on 18¾ inches of gravel which is graded from 1/16-inch to 2½ inches in size. The strainer system is constructed of inverted half-round cast iron pipes 6 inches in diameter, placed 9 inches center to center and resting on cast iron spacers. The bottom of each pipe is ½-inch above the concrete floor, forming a practically continuous horizontal orifice of this depth on both sides. The construction of the strainer system is the same as that installed by the author last year in the 15-million-gallon municipal plant at Tampa, Fla., which has been giving excellent service.

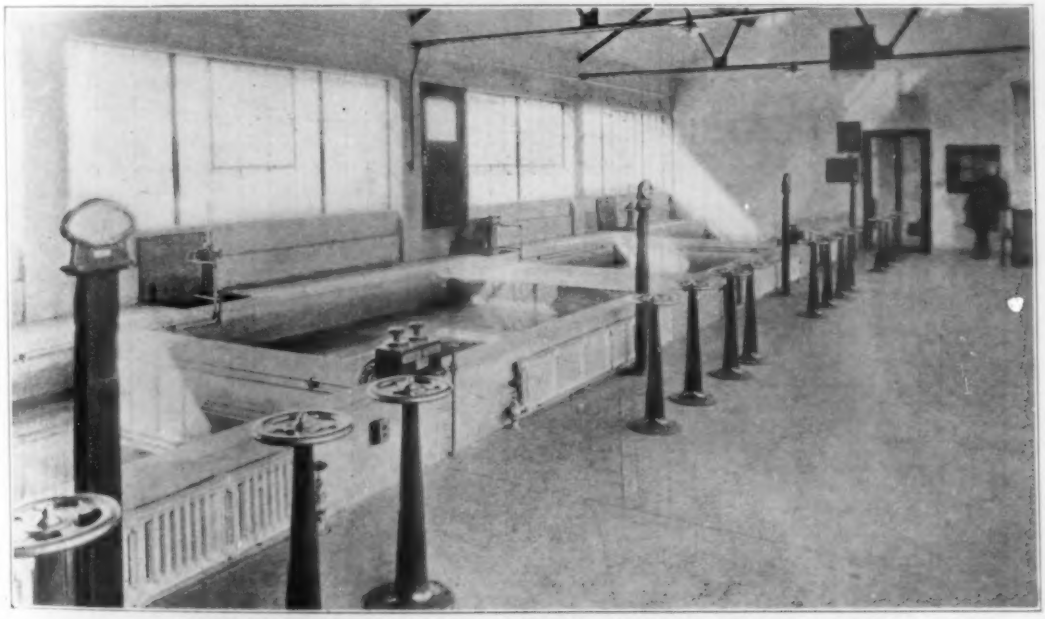
The wash-water troughs are of concrete with half-round upper edges. Two are provided in each filter box. The gutters discharge into a main channel along the front face of the filters. Simplex Valve and Meter Company rate-of-flow controllers are installed on the filtered-water outlets. No operating tables have been provided. All valves, with the exception of the settled-water inlet valves, are hand-operated from gate stands on the operating floor. The settled-water valves which are placed at the rear of the filters are hydraulically controlled from the operating floor.

Wash water is taken from the high-pressure main and stored in a 20,000-gallon elevated tank adjacent to the filter building. The supply to the tank is controlled by an altitude valve. A Ross regulating valve in the wash-water line controls the pressure at the filters. Provision has been made for washing at the rate of 2 cubic feet per minute per square foot of filter area.

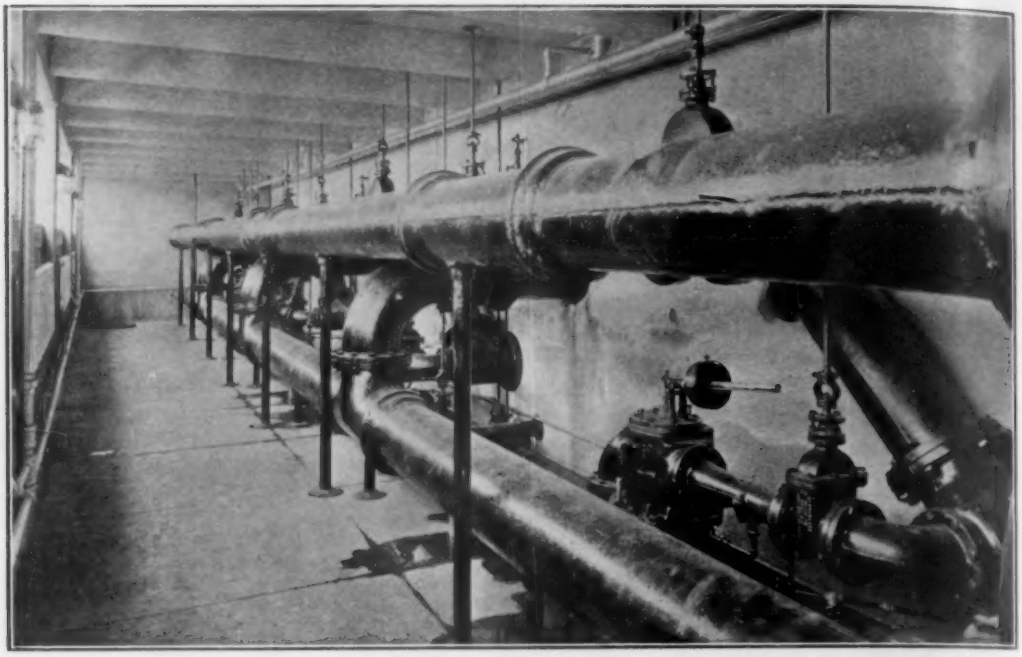
All filter piping is easily accessible from the pipe gallery floor beneath the operating room. Particular attention was given to this feature, the pipe gallery being well lighted and easily accessible from the main floor of the pump-room.

The filtered-water basin is beneath the filters and pipe gallery. A central baffle-wall extends the length of the basin for the purpose of insuring the circulating of water after chlorination and before it reaches the high-lift pump suction.

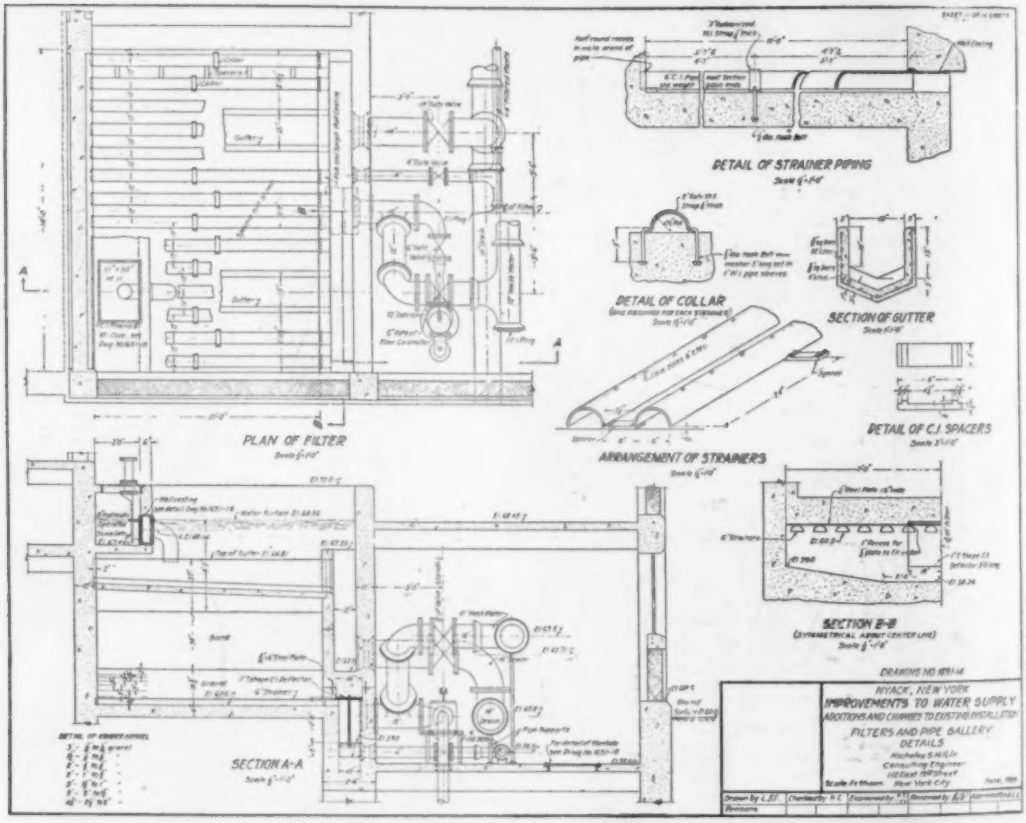
Sulphate of alumina is used for coagulation, and soda ash to correct the alkalinity. These



FILTER OPERATING GALLERY OF THE NEW NYACK WATER-WORKS



THE FILTER PIPE GALLERY, SHOWING AMPLE ILLUMINATION FROM WINDOWS AT LEFT



DETAILS OF FILTERS AND PIPE GALLERY OF NEW NYACK FILTRATION PLANT

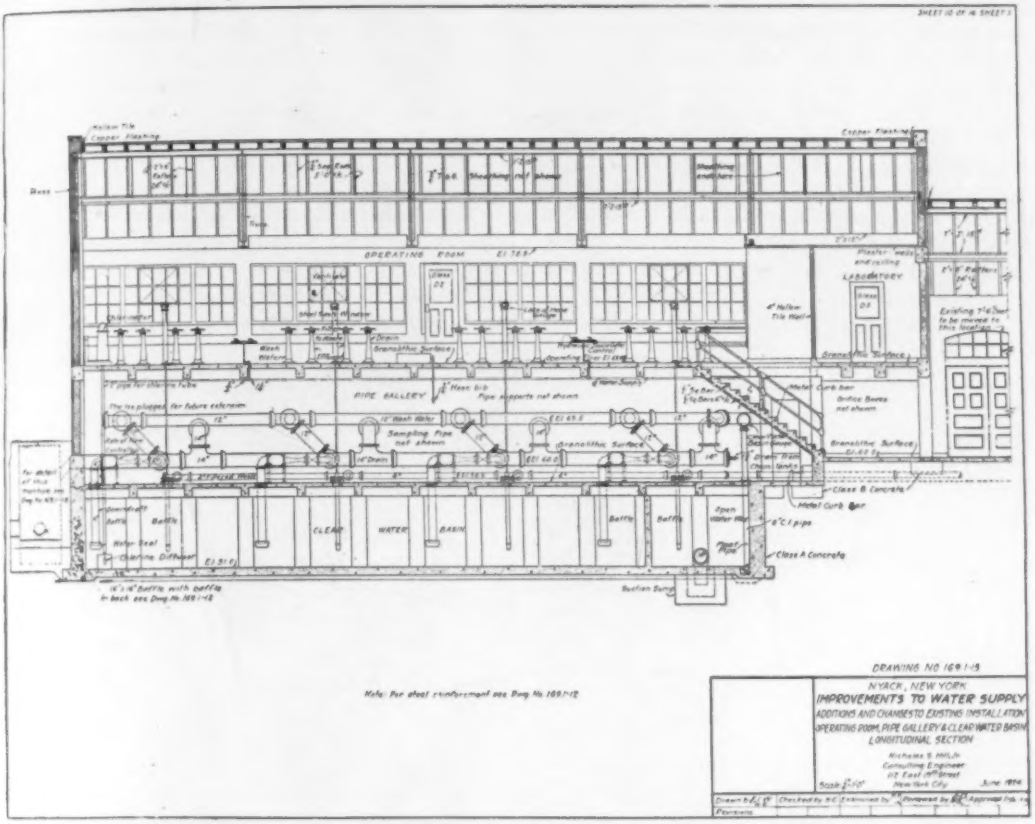
are applied in the suction line of the low-lift pumps, the pumps being used to perform the function of a mixing basin, which was omitted from the installation. Four chemical dissolving tanks are provided for the chemical solutions. An agitator of the propellor type is placed at the bottom of each tank. These are driven by water motors directly connected to vertical shafts.

As the plant will be operated by the regular station crew and no trained chemist will be in charge, provision has been made, as far as practicable, for simplicity of operation. The rate of flow of the raw water to the coagulating basin is registered, indicated, and recorded by a venturi meter in the discharge line from the low-lift pumps. Indicating gages, with high- and low-water electric alarms, are placed on the wash-water line and filtered-water reservoir, as well as on each of the chemical solution tanks. Simplex Valve and Meter Company rate-of-flow and loss-of-head gages are provided for each filter unit.

An automatic hydraulic water pump has been installed with suction connected to the raw-, settled-, and filtered-water lines. The discharge is provided with sight glasses located on a panel in the pump-room, for visualizing the character of the water as it passes through the plant. Orifice boxes are provided for each chemical solution. These discharge into pump suction tanks arranged with floats so as automatically to prevent the entrance of air into the low-lift pump suction. Chemical-feed lines where not easily accessible are of rubber hose laid in vitrified pipe conduits. Provision has been made for a secondary application of alum at the outlet end of the sedimentation basin, should such a treatment be desirable before the water passes to the filters.

A small room, approximately 7 x 9 feet in plan, has been provided in the filter building at the end of the operating gallery, with such laboratory equipment as is essential to the operation of the plant.

First cost being an important factor, the building over the filters, operating gallery, and pipe gallery is of the factory type of hollow-tile stucco construction with large window areas. Operating tables and hydraulic valves for filter operation were omitted, and only the construction considered essential for per-



LONGITUDINAL SECTION OF THE FILTER HOUSE, PIPE GALLERY AND CLEAR-WATER WELL

manency and necessary for operation was undertaken.

Changes in Pumping-Station

In addition to the filter plant construction above described, radical changes were made in the pumping-station and equipment. More high-lift pumping capacity was needed to meet the increased water consumption, while the use of mechanical filters necessitated low-lift pumps for lifting the raw water to the coagulating basin. In compliance with the desires of local officials, the old steam plant was abandoned and electric power installed for all pumping units. These changes involved the removal of the two boilers and the Worthington steam pumping-engine. The old motor-driven centrifugal pumping unit was retained and an additional unit of 2 million gallons daily capacity installed for high-lift pumping service. Two motor-driven centrifugal pumping units, each of 1.5 million gallons daily capacity, were provided for low-lift service. The new equipment is located partly in the old building and partly in a connecting room between the old pumping-station and the new filter-house.

The total cost of the work, including all engineering and incidental expenses, was approximately $100,000. The construction was divided into four contracts. James L. Bried of Englewood, N. J., was the contractor for the excavation, concrete work, building construction and connecting piping. James E. Williamson, 39 Cortlandt Street, New York City, was the contractor for the filter equipment. The Turbine Equipment Company, 30 Church Street, New York City, was the contractor for the pumps and electric equipment, and Messrs. Tippett and Wood, of Phillipsburg, N. J., had the contract for the erection of the wash-water tank and tower.

The engineering work connected with the preliminary studies and the design and construction were performed by Nicholas S. Hill, Jr. Joseph R. Forsyth, Assoc. M. Am. Soc. C. E., was resident engineer.

The Relation of Forestry to the County Park Idea

THE importance of forest land in a county park development, and practical suggestions in relation to county forests, were presented in a discussion at the thirteenth annual conference on Highway Engineering at the University of Michigan, February 18, 1927, by H. F. Larson, Engineer-Manager, Iron County Road Commission, Crystal Falls, Mich. Mr. Larson said in part:

"We must not overlook the fact that some comprehensive plan should be adopted in regard to the future for forestry in your respective counties. Here is a wonderful chance for you to demonstrate to the world what can be done along this line.

"First of all, in any plan, the county should set up a goal towards which it should travel. How much land should the county ultimately acquire to attain the objectives it has in mind? Personally, I believe this goal should be from 20,000 to 25,000 acres or more if you so desire. This would in most counties be a small contribution towards putting their large undeveloped land areas into profitable and permanent use.

"What investment would such a program involve? It would all depend upon what kind of land you acquired. It would mean, of course, a fairly heavy investment if all the land to be acquired is virgin or old timber. This, however, is not necessary. Except for beautifying our highways, most of the county forests should be cut-over or second-growth land. Such lands could probably be acquired for from $1.50 to $5 per acre, according to location and the character of the second growth.

"In what size units should these county forests be acquired? The larger the unit, the cheaper will be its administration for a revenue-producing economic unit. A section or at least half a section should be the minimum unit, and if you can get two or three sections together, so much the better. The closer they are located to your cities, the higher will be the ultimate revenue that can be obtained from them. Watersheds in the county should not be overlooked if you are depending upon them for your water-supply.

"What benefits and revenue can the county derive from such a system of parks? If the parks are made up entirely of cut-over land or second growth, at first there would be no revenue at all. As a matter of fact, it will be necessary to do some planting, and for this work county prisoners or Boy Scout organizations along with some hired help can be used. When all your forests are in a good, healthy, productive condition, the county will be able to derive a permanent annual income of about $3 per acre per year, and if you have about 25,000 acres working, you will be turning in a revenue of about $75,000 a year without interfering in the least with the recreational value offered by such forests."

Ordinance to Restrain Exhibition Flying

TO prevent trick and stunt flying over assemblages of people, with the accompanying risk of serious accidents, the city of Toledo has enacted an ordinance which makes the following provisions:

"That no person, firm or corporation shall operate for the purpose of giving an exhibition of any aeroplane or aircraft over any parks, athletic fields, public playgrounds or any place where a large number of people congregate.

"Any person violating the provisions of the above ordinance shall be guilty of a misdemeanor and be fined in a sum not to exceed $500, or imprisonment for not more than sixty days, or both."

Some Current Practices in Dance Hall Regulation

By Chloe Owings
American Social Hygiene Association

THE licensing and regulation of dance halls, while meeting a similar problem of inside control in cities and in rural sections, encounters different sets of conditions in other aspects of the two types of communities. So far, attention has been directed principally to city dance halls. The roadhouses and dance halls situated outside the jurisdiction of cities and towns, on good roads and easily accessible by automobile, constitute one of the most serious of all dance hall problems. This type of establishment has increased so rapidly that legislation and law enforcement practice have not been able to meet the situation properly.

There is little published information on this subject. In recent years there have been some studies of dance halls in cities.[1] The Children's Bureau of the United States Department of Labor has completed "A Field Study of Methods of Supervision and Control of Commercial and Community Recreation in Fourteen Cities," and the report is in preparation. This report will include a summary of the dance hall ordinances of towns and cities of 15,000 population or over, and a study of the methods of ordinance enforcement and administration.

Dance Hall Supervision in Some Wisconsin Counties

Recently a study was made of the supervision of dance halls in some rural communities in Wisconsin.[2] While categorical conclusions as to the results of the system of county board regulation and supervision were not possible, because it had been in operation for only a short time,—a few months in some counties to two years in others,—the study furnished some observations of value because it was the first of its kind.

It is of particular interest to those towns and cities which are face to face with problems created by nearby commercial amusement places situated outside their jurisdiction. Supervision of this type of roadhouse and dance hall was the object of legislation in Wisconsin in 1923.[3] The act enabled county boards of supervisors to license and regulate places of public amusement. The report covers observations made in thirteen counties which profited by this act and provided for the licensing and supervision of rural public dance halls, with penalties for infractions. The essential points of the Wisconsin study are here summarized.

Supervision of City and Rural Dance Halls

The problems created by commercial amusement places outside of cities have been dealt with in Wisconsin by legislation enabling county supervisors to license and regulate such roadhouses and dance halls. Thirteen counties have profited by this act. Observations made of the resulting conditions in these counties are summarized in this article.

The results of other legislative or social attempts to protect young people by dance hall supervision are also presented. It has been shown that commercial dance halls can be properly supervised and still make profits, and that women police officers can assume central supervision successfully.

The character of the supervision varied greatly according to the type of inspector. No examinations were held for prospective inspectors, who were usually appointed on the recommendations of the two supervisors. In two counties the deputy sheriffs acted as inspectors, but in the other eleven counties other persons had been appointed—among them a few women. Inspectors were paid from $3 to $5 for each dance supervised, and in most counties this fee was not paid until the inspector's written report had been turned in on a special form. The fees were sometimes supplemented by the dance hall proprietor.

Among the regulations as to the conduct of dances are: a specified closing hour, usually 1 a. m.; minors under 16 years of age (17 years

[1] See Bibliography.
[2] The Working of County Dance Hall Ordinances in Wisconsin.—By Frances H. Hiller, Field Secretary, National Probation Association in January, 1927, *Journal of Social Hygiene*, 370 Seventh Avenue, New York. These observations of the working of the county dance hall ordinances in Wisconsin after two years of trial are taken from a study of probation in Wisconsin made under the auspices of the National Probation Association, the American Social Hygiene Association, the University of Wisconsin, and the State Board of Control of Wisconsin.
[3] Laws of Wisconsin, 1923, Chapter 222.

in one county) shall be excluded unless accompanied by parents or guardians; dance halls shall be well lighted; the use or possession of intoxicating liquor by persons attending dances shall not be permitted; intoxicated persons shall be excluded; in a few counties, dancers shall not be allowed to leave the hall except during regular intermissions or by permission of the inspector; no disorderly or vulgar conduct shall be permitted; dance halls shall be kept in a healthful and sanitary condition; idlers or loiterers shall not be permitted; and sundry other provisions.

The inspectors found it difficult to enforce the provision forbidding the presence of minors under sixteen who are unattended, because today, age, particularly of girls, is not easy to determine. In some places children from ten to twelve years of age played about the floor, presumably brought by their families.

With the exception of one county which required that the rules of the American Association of Masters of Dancing[4] should be adopted and a copy of them posted in each public dance hall, no standard definitions of "disorderly or vulgar conduct were found." Each inspector defined it according to his own standards and moral courage in its enforcement. At one dance hall in the county, where the rules were posted on the wall, an attempt to control the manner of dancing led to so much trouble that this effort was discontinued. One couple in six danced according to the rules. In two or three counties, inspectors claimed that they warned numerous couples and put them out for second offences, and one county reported arrests for improper dancing.

The posture in dancing is difficult to regulate because of the character of certain of the modern dances. Inspectors claimed that it is impossible to watch the dancing and the grounds outside at the same time. Inspection of the grounds was in most counties very poorly done, if attempted at all. The condition claimed to exist in connection with dance halls in cities, namely, that, even with inside control, the automobile offers a safe retreat outdoors where the use of liquor and conduct cannot be supervised, was present and even aggravated in rural communities because parking regulations were practically non-existent. Thus the rural roadhouse and dance hall can serve as an objective for an automobile ride, and the car itself offers a tempting seclusion when the dancers wish to withdraw from the observation of the public. At many of the dances, cars were parked in long rows, many of them in dark places.[5]

Such penalties have been imposed as refusal for the renewal of an annual license, revocation of an existing license, or preliminary warning of a recalcitrant proprietor. In some instances, proprietors have been compelled by the inspector to refund admission fees of persons who have been ejected by the inspectors.

The majority of sheriffs, judges, district attorneys, social workers, and interested lay citizens stated that, under the regulation system: (1) closing hours are earlier; (2) conduct on the dance hall floor is less "vulgar and disorderly"; (3) where the inspection itself is not altogether satisfactory, some dance hall proprietors themselves are enforcing the rules to avoid unfavorable reports; (4) the use of liquor and the number of intoxicated persons has increased in some localities and decreased in others; and (5) this experiment has again demonstrated the old truth, ever present in law enforcement activities, that where general public sentiment is strongly in favor of enforcement and actively makes known its desires, a system of regulation works, and where *laisser faire* is known to be the general public opinion, no laws can be effectively enforced.

The report carries recommendations for the employment of some women inspectors, supervision of the immediate vicinity of dance halls, uniform standards for the direction of inspectors, and centralization of responsibility of inspection.

Better Conditions are Being Established in Some Places

In other discussions of the subject as well as in the Wisconsin study, one perceives that interested persons are concerned primarily with two things: first, the possibility of providing through commercial dance halls wholesome leisure-time activities for young people; and, second, the elimination of those features which encourage sex promiscuity, particularly in relation to the exploitation of adolescents.

Various efforts in dance hall regulation, some in the form of experiments or demonstrations, have been made in several cities. For instance, the members of the Juvenile Protective Association of Chicago have for years devoted much time to this subject, their motivating thought being that "the providing of amusement is a legitimate business." They have demonstrated that the best proprietors and managers are eager to cooperate in providing clean dances. After the Association had made a periodic series of surveys of dance halls, with reports to the managers, a few of the latter group met

[4] Rules, Regulations and Suggestions Governing Social Dancing.—American National Association of Masters of Dancing, 319 West Third Street, Dayton, Ohio.

[5] Proposed House Bill No. 591, Kansas State Legislation 1927, would render mandatory a 6-foot wire fence within which all cars of patrons must be parked.

in February, 1921, and organized the National Association of Ballroom Proprietors and Managers. They now maintain an office in the rooms of the Juvenile Protective Association, and a member of that staff has acted as their secretary.

The Juvenile Protective Association selects hostesses who supervise the conduct of patrons during intermissions, and who are paid by the dance hall proprietor. A floorman supervises dance floor conduct. In 1922, a "correct dance week" was held in each hall, terminating in a "correct dance night" in one of the largest halls. Correct dancing was demonstrated by the proprietors, and rules were formulated for posting in the halls.

In the efforts to eliminate the "plugger," a card advertising the dance hall and carrying, on the reverse side the words of a song, usually indecent, it developed that the Musicians Union has a by-law which forbids the playing of indecent music by its members and that the Printers' Union has a by-law forbidding the use of union labels on indecent printed matter. The Association of Ballroom Proprietors and Managers moved to prohibit the playing in ballrooms under their management of songs bearing salacious titles or indecent words. Since then no objectionable "pluggers" have been noticed.

The attention of the Juvenile Protective Association was then turned to music—for these indecent songs were all set to jazz. The dance music time now in these ballrooms in Chicago is 74 by metronome beat. Those interested say that dances such as the "shimmy" are impossible with slow music, hence they have disappeared.

Places still exist in Chicago which permit of every dance hall evil. Constant effort has to be made to attract young people to the better halls, for those individuals who profit by the sale of liquor and by sex exploitation are ever on the alert to attract patrons.

Recent Dance Hall Legislation

Among the most recent dance hall legislation is the Louisiana Law (1926) regulating public dance halls, cabarets, and other places where public dances are held; the Massachusetts Law (1926) authorizing cities and towns by ordinance, or by law, to regulate within their respective limits entertainments and other diversions and amusements not already required by law to be licensed; the Massachusetts Act (1926) requiring the licensing of keepers of inns, restaurants and other establishments who conduct certain amusements, including dances, in connection with their business; and the Virginia Act (1926) for the regulation of public dance halls in any county adjoining a city of 50,000 inhabitants or more. House Bill No. 591, proposed to the 1927 session of the Kansas State Legislature, deals with this general subject.

A study by the United States Public Health Service showed that 75 of the 100 largest cities in the United States reported some supervision of dance halls. Of these 75 cities, 58 left such supervision to the police department or to special inspectors supplied by the city.[6]

In some cities women police are assigned to the supervision of dance halls. In Wichita, the dance hall ordinance provides that the supervisor shall be appointed by the city manager, and shall work in the Women's Bureau of the Police Department.[7] The dance hall license is given to an individual, not to the establishment, and the licensee is responsible to the supervision. A plan of cooperation with the dance hall management similar to the Chicago plan has been developed. An added feature is that the conduct of individual boys and girls is taken up with them and their parents. If the situation requires it, various social agents such as visiting teachers and officers of private protective associations cooperate.

Among other cities, Indianapolis has placed a considerable responsibility for the supervision of dance halls on their women police. The policewoman sergeant of that city has stated that it has been shown that much preventive and protective work among young people can be done in connection with dance hall supervision.

Some cities, notably Hartford, Conn., have initiated community dances in their departments of recreation. The City Recreation Department of Detroit has developed a "Friendly Club." Registration and three months' probation precede election by the Executive Committee, which is elected by the membership and which, among other forms of recreation, sponsors and supervises dances.

It has been demonstrated that, in a large city such as Chicago, the proprietors can provide proper supervision and still make attractive profits; that in a smaller city like Wichita the women police officers can assume central supervision successfully, and that in rural communi-

[6] Municipal Health Department Practice for the Year 1923.—Based upon surveys of the 100 largest cities in the United States. *Public Health Bulletin* No. 164, July, 1926, issued by the United States Public Health Service. Apply to Government Printing Office, Washington, D. C.

[7] Bulletin No. 21, July, 1926, International Association of Policewomen, Evening Star Building, Washington, D. C.

ties some form of supervision is feasible.

Perhaps in the not far distant future we may expect to find that the dance hall proprietor will pay for the supervising personnel, who will be responsible to a head inspector in the police department, or the sheriff's office, and endorsed by them. If such a situation comes to pass, the head inspector should be a person—preferably a woman—possessing broad general and special training and experience in the prevention of delinquency. She should be selected for her particular qualifications of temperament, personality, and interest in this field of social effort.

EDITORIAL NOTE.—Miss Chloe Owings, author of the foregoing article, is director of the Division of Protective Measures of the American Social Hygiene Association and a staff member of the New York School of Social Work. Her previous experience in the field of social work included four years as general secretary of the Associated Charities of Poughkeepsie, N. Y. In October, 1916, she became associated with the American Relief Clearing House in France, and worked in military hospitals and with the American Red Cross in France until the signing of the armistice. After this, Miss Owings spent some time in study at the Sorbonne, Paris, where she received, with highest honors, in March, 1923, the degree of *Docteur de l'Universite de Paris.* (*Lettres.*)

While in France Miss Owings was a member of the staff and of the committee of the École Pratique de Service Social. In Paris she founded the Social Service Committee at the Children's Court, and also instituted the first definite course in social case work in France. During the last three years, as a member of the staff of the American Social Hygiene Association, she has conducted an exhaustive research into the history and methods and work of policewomen, and has written a book on "Women Police" (see THE AMERICAN CITY for February, 1926, page 221).

It is suggested that readers of this magazine feel free to call upon the American Social Hygiene Association for information and assistance relating to the subject of the foregoing article or other problems connected with social hygiene.

Bibliography on Dance Hall Regulation

Charter and By-Laws of the National Association of Ballroom Proprietors and Managers, 616 South Halstead Street, Chicago, Ill.

Dance Hall Regulation.—By Sophia Hall. 1922. 17 pp. Information Report No. 26, Municipal Information Bureau, University Extension Division, University of Wisconsin, Madison, Wis. A brief statement of studies made. Analysis of a typical case, discussion of state and municipal regulation, and a copy of the Dance Hall Ordinance of Madison.

Evidences of Social Relations as Seen in Types of New York City Dance Halls.—By LeRoy E. Bowman and Maria Ward Lambin. In the January, 1925, *Journal of Social Forces*, published by William & Wilkins Company, Baltimore, Md.

Pamphlets published by the Social Advisory Committee, Church of Jesus Christ of Latter-Day Saints, Salt Lake City, Utah.—(1 Social Dancing; Pamphlet No. 4, 1920; 8 pp. (2) Program of an Institute on Dancing, with resulting recommendations on dancing as recreation, music "dance atmosphere," gallantry, chaperonage, dance legislation, posture, and Dance Director. (3) A Statistical Study of Social Dancing; Pamphlet No. 6, 1920; 4 pp. (4) Instructions on Social Work; 1917; 16 pp.; a handbook for dance committee chairmen. (5) Standards of Dancing and Dance Direction; Recreation Bulletin No. 3, 1924; pp. 59-72.

Pamphlets published by the Playground and Recreation Association of America, 315 Fourth Avenue, New York.—(1) Commercial Recreation Legislation, by Julia Schoenfeld; pp. 461-481, The *Playground*, March, 1914; recommendations and model legislation concerning dance halls. (2) The Municipal Dance Hall in 1921; resumé of practices in nine cities. (3) Conduct of Community Dances; 1925; Bulletin 1280; detailed suggestions to persons conducting dances, relating to type of hall, music, supervision, chaperonage, dance position, conduct on the floor, and description of possible dances.

The Public Dance Hall.—By Frances Ingram. Page 512, report of the 1919 Conference of Social Work. Description of the efforts of the Board of the War Camp Community Service to standardize the public dance halls in Louisville, Ky., in cooperation with the Police Department; statement of regulations, situations encountered and how they were met.

The Regulation of Public Dance Halls.—St. Louis Public Library Bulletin, Vol. V, No. 8 (1914). Summary of dance hall legislation; text of laws in twenty cities, with summary of cabaret performances and public dancing in restaurants and cafés. (Apply to Municipal Reference Library, Room 211, City Hall, St. Louis, Mo.)

Report of the Advisory Dance Hall Committee of the Women's City Club and the City Recreation Committee, New York City.—By Maria Ward Lambin. 1924. 39 pp. A study of types of dance halls in New York City, their regulation, their economic organization, number and type of patrons, estimated expenditures in commercial dancing, social conditions involved, and recommendations for supervision of public dance halls. 25 cents. Apply to the Women's City Club, 22 Park Avenue, New York.

Report of the Public Dance Hall Committee of the San Francisco Center of the California Civic League of Women Voters.—By Maria Ward Lambin. 1924. 24 pp. Historical summary and psychology of the dance; its social control and a policy of regulation; history of dance hall regulation and supervision in San Francisco and its results. 25 cents. Apply to the Civic League, Hotel St. Francis, San Francisco, Calif.

Rules, Regulations and Suggestions Governing Social Dancing, Indorsed by the American National Association of Masters of Dancing.—President of the Association, Fenton Bott, 319 West 3rd Street, Dayton, Ohio.

The Social Evil in Chicago.—Published by the Vice Commission of Chicago. 1911. The dance hall as a source of supply for procurers, as a center of solicitation by prostitutes, and as found in saloons; numerous personal histories of girl patrons. Distributed by the American Social Hygiene Association, 370 Seventh Avenue, New York.

A Study of Dance Halls in Pittsburgh.—By Collis A. Stocking. 47 pp. in the report of the 1925 Pittsburgh Girls' Conference. Covering types, attendance, equipment, patrons, admission and other charges, laws and supervision, with a discussion of the public dance hall as a recreation center, and suggestions for possible community action. Transcripts from field notes are appended.

Review of Dance Hall Surveys and Legislation.—In various issues of *The Survey*, 112 East 19th Street, New York. (1) Editorial review of dance hall surveys and legislation, June 3, 1911, pp. 344-346. (2) Study of dance halls of Chicago, made by the Juvenile Protective Association; June 3, 1911, pp. 383-387. (3) Dance hall laws in operation; what was expected of the "new" dance hall law in New York City in 1911, and why; April 1, 1911, pp. 12-13. (4) Our Dancing Cities, by John J. Phelan; preliminary report of a study of dance halls in 180 cities in the United States and Canada; January 29, 1921. (5) This Business of Dancing—a symposium; conditions in dance halls in New York City and in San Francisco, with thesis that dancing is not "play" or "recreation," as it is now practiced in commercial dance halls; July 15, 1924.

TO EDITORS.—*With the exception of an occasional article or illustration bearing a copyright notice, material in* THE AMERICAN CITY *may be reprinted freely in whole or in part. The courtesy of a credit line is the only acknowledgment requested.*

Garbage Park, Oakland, a Successful Experiment in Esthetics

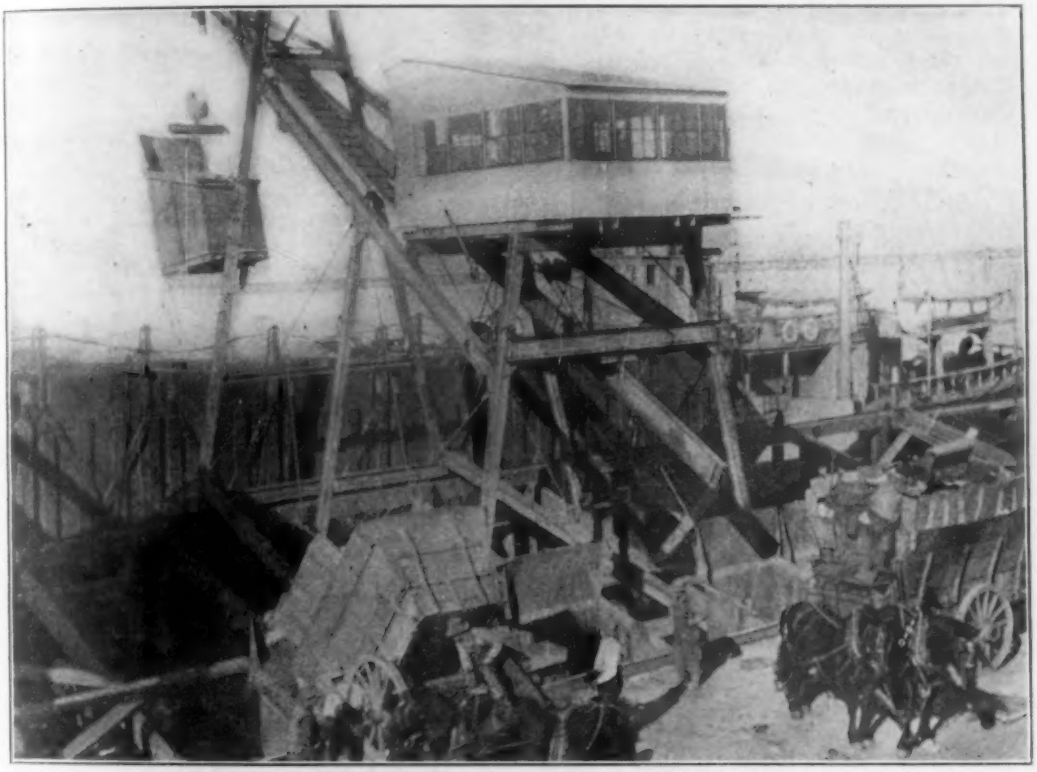
By W. W. Harmon

Superintendent of Streets, Oakland, Calif.

THE science of making a city as beautiful as possible is not necessarily divorced from the most utilitarian and menial task a city must perform for its residents—the collection and disposal of garbage and refuse. The city of Oakland, Calif., has proved this in the last year with the successful operation of its "Garbage Park," the only spot on the western waterfront of the city where grass, trees, and flowers are flourishing, and the only garbage disposal plant of its kind in the country.

Not only is a thing of beauty growing out of an ugly problem, but Oakland is now saving 87 cents a ton over the cost of previous methods of disposal, and it has the low net cost of 69 cents a ton for garbage disposal. In a little more than a year, more than 100,000 tons of garbage and refuse of all kinds have been hauled through the park, loaded on ships and dumped into the Pacific Ocean, 40 miles out beyond the entrance to the Golden Gate.

Garbage Park is a 1½-acre plot built over a former sanitary fill on the waterfront, sodded and planted with trees and shrubs, banked with flowers, and laid with whitewashed cobblestones. Not the least interesting part of the undertaking is the fact that every bit of foliage and grass was donated and planted by citizens of Oakland who became interested in the project. These donations of time and materials were unsolicited.



LOADING GARBAGE AT OAKLAND'S WHARF

The crane travels along the edge of the wharf on rails, picking up the steel skips as they are loaded and dumping them directly into the waiting ships. The wagons and skips hold 5 yards and the ship's capacity is about 600 tons

What the System Has Done

Here are some of the things we figure Garbage Park and the present system of disposal have done for Oakland in slightly more than

a year of operation:

1. Greatly lowered the cost of disposal.
2. Made Oakland a truly sanitary city.
3. Eliminated the rat evil and the danger of fire starting underground from spontaneous combustion—always an element to be considered in operating a sanitary fill.
4. Converted a dangerous liability into a civic asset.
5. Done away with several acres of breeding-ground for flies.
6. Disposed of the familiar garbage dump, and the attendant problem of having waste material picked over and removed after it is once dumped.

Up to about fourteen years ago, Oakland always had dumped its garbage into the sea. This caused a good deal of agitation for an experiment with some other method of disposal, especially since in 1912 a ship from the plant was lost in a storm. It was protested that when a ship dumped garbage at sea, some of it drifted back to shore, and that for this and other reasons, the method was extremely unsanitary.

The Sanitary Fill

Officers of the city decided to build a sanitary fill on the Oakland harbor front, spreading the refuse material out over a large area of reclaimed land and covering it with sand. This, it was believed, would be a cheap and efficient method of filling in the portion to be reclaimed, but as harbor development has progressed, it seems that there is not enough room for placing excavated material.

In my opinion, there is no such thing as a "sanitary fill." Dumping sand on garbage amounts to the same thing as building a roof on a rat's house. The practice in Oakland proved to be just that. The fill caught fire one day, and literally thousands of rats were smoked out and driven to other parts of the city while the fire department battled with the conflagration.

Shortly after this, the port of Oakland was quarantined by the War Department of the Government because of unsanitary conditions on the waterfront, and I received permission from the City Council to proceed with my plans for improving on the former method of disposing of the city's waste by dumping it into Davy Jones' locker. The first load went out of Garbage Park in the late fall of 1925.

The Disposal Plant

The mechanical part of the disposal plant, which cost the city $38,000 to build, was designed in the city engineer's office and erected by a contractor. The wharf or terminal at the park is located at the foot of one of the city's main streets, and a fine paved road, which later will tap the whole western waterfront area, leads directly to it.

The material to be disposed of is all brought to the park in trucks and wagons and dumped off the end of the wharf into 5-yard, bottom-dump skips, arranged as shown in accompanying illustrations. There are ten of these skips, and at loading position they rest with their tops flush with the wharf.

Two traveling cranes, powered with General Electric motors, lift the skips out to the end of their 80-foot booms, where the load is dropped directly into the ship's bunkers. There is no waste effort.

Two steam schooners with side-dump apparatus and bunker capacity for 600 tons, are operated under contract for the city. One ship-load takes care of two days' collections, and the two ships make three trips a week between them. The bunkers are shaped on the bottom like the roof of a house, with the ridge-pole amidships and parallel to the keel, and the load easily slides into the water when the side doors are lifted.

It takes only three minutes to empty the entire load into the sea. In a year of operation, neither of the two ships has missed a single trip. One is always at the wharf while the other is making a trip.

Disposal Costs Tabulated

While the net cost of disposing of Oakland's garbage is 69 cents a ton, the actual cost is $1.10. The difference is made up in toll charges collected from citizens and business houses that wish the city to dispose of extra waste material.

Here is a tabulation of our last year's cost, figured on the basis of 100,000 tons actually disposed of:

Operation	Cost Per Ton	Total Cost
Collection and hauling	$0.23	$23,000
Shipping and dumping	.87	87,000
Total	$1.10	$110,000
Revenue from toll charges at $1 per ton		$27,000
Net cost per ton	.69	
Net total		$83,000

Citizens are being educated to bring their waste material to Garbage Park for disposal by the city, and they are responding better than we had anticipated. We offer to get rid (permanently) of anything from a last year's hat to a wrecked automobile. The money collected for such services is placed in the city treasury. Some of those who have become interested in beautifying the park first saw the need of it when they brought material to the wharf for disposal.

GARBAGE PARK, OAKLAND, CALIF., BEFORE AND AFTER LANDSCAPING

Operating Problems

Twenty-five per cent of all the material collected for disposal is metal—tin cans and so on. This sinks like shot, carrying everything with it. But to prevent any floating material from drifting in on the surface of the sea after it is once dumped, all barrels, boxes, and tree cuttings are burned in piles at one edge of the park, beyond the road over which the refuse is carted to the wharf. This is out of the way, and not at all unsightly, and the ship does not have to carry any more unwieldy bulk than necessary.

Several tests were made before it was determined just how far to carry before dumping. At 20 miles from shore, a strong current carried some of the material back to shore. At 30 miles it was better, at 35 miles, better still, and at the 40-mile mark the material stays put.

One trouble with former sea-dumping methods was that the refuse wasn't carried out far enough. Currents and tide-rip must be considered, and we found it impossible to get dependable results without conducting exhaustive tests.

Oakland's collection department has 40 teams and wagons of 5-yard capacity and 22 trucks of 10 to 15 yards capacity for long hauls. While formerly 30 to 40 men were employed on the sanitary fill, to smooth it out and spread it and cover it, the present disposal plant employs only nine men regularly at Garbage Park, exclusive of the ships' crews—one scale man, two night watchmen, an inspector, a crane man, and four laborers. This amounts to a considerable saving in costs on labor alone.

Landscaping and Layout

The park is being beautified, fortunately, by persons who, although they are donating the materials and their own time, know something about landscape gardening. Ivy is being trained over the breakwater; neat gravel paths and roadways lined with whitewashed cobblestones are laid out; palms and other trees have been tastefully planted and are growing thriftily; raised banks of flowers are planted and growing. In front of the biggest bank of flowers and opposite the white gateway the letters G. P. (Garbage Park) are set in gold leaf.

The gravel road leading into the park, over which all the refuse is hauled, forms a loop. Wagons and trucks enter the gate, pass over the scale platform, turn to the right, and line up for dumping. On the way out, they pass again over the scale platform for a second weighing.

A tank of salt water, pump-filled, affords fire protection for the wharf, and fresh water is piped in for watering the trees, grass and shrubs. The wharf is washed thoroughly each night from the salt water tank, and the ships are washed at sea after each dumping, so perfect sanitary conditions prevail at all times. Half a dozen rat-traps placed at the edge of the stone breakwater catch, on the average, only about one rat apiece every two weeks.

The park is not designed as a playground for children or for a recreation center, although the proposed development of the waterfront, for which $10,000,000 in bonds already has been issued, may make such adaptation profitable and desirable in the future.

The park lies, however, in full view of the Key System Transit Company's mole, leading to the Oakland ferry slips. Hundreds—thousands, rather—of commuters and visitors to the city pass by here every day. It would be a poor investment to keep an unsightly refuse dump at Oakland's very portals. As it is, Garbage Park is the only green spot on the shore line visible from passng trains.

The Name "Garbage Park"

A good deal of comment was aroused by our choice of a name for the park. It was of course intended to convey the idea that the disposal plant is an asset to the city rather than some-

thing to be hidden away in one of the most inaccessible districts, and that the word "garbage" need not necessarily have an objectionable significance. The name will not be changed—it is there to stay.

The following sample of newspaper editorial comment from the Oakland *Times* gives a good idea as to the effect this name has had on public opinion:

"Announcement that the Street Department of Oakland has transformed in the last few months the city's hideous and malodorous garbage dump into an attractive public park of shrubs, flowers and trees has given a great and pleasant surprise to many citizens remote from the harbor front.

"The transformation process has been going on slowly and quietly, it seems, and has been made possible by the generosity of various citizens who have made voluntary donations of plants, trees and vines.

"This new public place, swept by the pure, sweet breezes of the bay and affording a magnificent view of the Golden Gate, has been named 'Garbage Park' ; a most daring appellation, suggestive to the uninstructed of ugliness rather than of beauty.

"It is a name that seems likely to stir a measure of controversy. It will necessarily attract wide attention . . . since it is bound instantly to challenge an explanation of its origin. . . ."

The publisher of another newspaper told me: "If you can get away with it, to have the city's disposal plant known as 'Garbage Park' will be an undeniable asset." We have indeed gotten away with it, and the city has shown its interest in Garbage Park in a pretty definite and tangible way.

A Practical Plan

There is no reason why any coast city in the United States cannot have its own "Garbage Park," similar to Oakland's; and any inland city can readily appreciate from the accompanying illustrations the civic value of making a place of beauty out of an eyesore. Garbage disposal is by no means beyond the pale of esthetic treatment.

Omaha's "Jitney" Ice Stations

MUNICIPAL ice plants are by no means unknown in this country; but Judson King, Director of the National Popular Government League, in an article in the March issue of *The Locomotive Engineers' Journal,* states that Omaha, Nebr., is the only city in the United States that operates municipally owned "jitney" ice stations. He goes on to say that a "jitney," in this case, "is a little ice house conveniently located in a residential section of a city where the people can buy ice cheap and in small quantities on the cash-and-carry system.

"Most of the ice is sold in 5-cent chunks—hence the popular designation. And a good chunk it is—as big as the pieces I pay 10, 15, and 20 cents for elsewhere. There are now 56 of these little stations scattered all over Omaha, but located chiefly in the poorer working-class districts.

"Do not smile at small things. The aggregate business done by these jitney stations annually is something tremendous. Last year Omaha's municipal ice plant sold nearly 66,000 tons of ice for about $300,000, with a net profit of more than $60,000. The plant has an investment value of $567,000.

"T. A. Leisen, general manager of the water, gas and ice plants—all owned and operated by the city—showed me the books and the balances, all of which prove that these enterprises are being run on strictly business lines without 'politics.' W. J. Barber, assistant to Mr. Leisen, took me out to see the ice plant and stations and explained the work to me. Also, he related the history of the plant and the fight to install and carry it on in the face of opposition from private business. He could well do so, for he was the man selected by former general manager Robert B. Howell, now United States Senator from Nebraska, to do the work.

"As manager of the water and gas plants, Howell came closely in contact with the people and perceived the crying need for cheap ice. The private companies were then selling ice at 60 cents per 100 pounds, delivered. Howell investigated, found how cheaply ice can be made in large quantities, and in 1918 had a bill introduced in the Legislature permitting the city to make and distribute ice. The fight was bitter. Howell got his bill, borrowed $200,000 from the Water Department, built an ice plant and eight jitney stations, and started in selling ice at 30 cents a hundred, in 5-cent chunks, if desired. The private companies dropped their prices to 50 cents a hundred, delivered, selling their ice to the better-to-do folks who can afford to have their ice put into the box from the wagon.

"The jitneys prospered. The people flocked to them. Howell found at the end of the first year he had not only rendered a great service but was making money. More jitneys were built. A new ice plant was constructed to meet the growing demand. Still it grew, till today there are 56 stations, a modern electrified plant, and two gigantic storage buildings where ice, made in the winter, is stored for use in the rush demand of hot summer months. All this has been paid for out of earnings, so that the plant stands practically debt free. The people who are its patrons have the consciousness of not being objects of charity, but partners in an enterprise of their own, run on sound business principles."

Twenty Years of Chlorination of Public Water-Supplies

By N. J. Howard

Bacteriologist in Charge of Water Purification, Toronto, Ontario

SINCE the first practical application of chlorine to water in Lincoln, England, in 1905, by Sir Alexander Houston, considerable advance has been made. The early application was by means of a commercial product called "Chloros," which consisted of an alkaline solution of sodium hypochlorite containing from 10 to 15 per cent of available chlorine. This was superseded, first, by George A. Johnson in 1908 in Chicago by the use of calcium hypochlorite, commonly known as bleaching powder. Following the research work in 1910 of Darnel, who demonstrated the practicability of using chlorine in gaseous form, the use of liquid chlorine extended, and in 1913 new and greatly improved equipment was put on the market, resulting in the general use of gaseous chlorine in an aqueous solution. Since that time, each year has shown fresh advances in application and use both in Europe and in America.

Many Mysteries Solved—Others Continue as Enigmas

The studies of the action of chlorine as an effective agent in the treatment of water for domestic purposes have revised the ideas regarding the cause of sterilization; have developed pre-chlorination, and chlorination for taste removal; have shown certain advantages of chloramine and dichloramine; and have developed superchlorination and dechlorination.

Our early ideas as to the germicidal properties of chlorine in water were based upon a study of hydrolysis which resulted in the decomposition of hypochlorous acid and the liberation of nascent oxygen known to have marked oxidizing properties. The results of recent researches have more or less disproved this theory, and J. C. Baker has suggested that the sterilizing action of chlorine in water is not due to direct oxidation by the chlorine, but to the formation of some substance toxic to bacteria which interferes with further cell division, thereby stopping multiplication and resulting in the death of the organisms.

In the early days of treatment, chlorine was used either as the final adjunct in a water purification process or as a straight sterilizing reagent to water partially purified or water receiving no other treatment. Apart from general considerations, many were opposed to the use of chlorine in water, claiming that the construction of purification works would be delayed so long as a safe water could be procured without filtration. Modern conditions, however, demand not only a safe water, but also a physically good supply. Rapid progress in construction of water purification plants in all parts of the world would seem to bear out this contention.

The Pre-Chlorination Process

The application of chlorine to water is not now confined to sterilization, but its use is being extended for various purposes. The pre-chlorination process, which consists of applying chlorine to water before filtration, was reported upon by Weston and Howard, the city of Toronto adopting the treatment in 1921. At the present time, according to C. R. Cox, a large number of cities in America are using this method. The process has many advantages, the chief consideration being an economic one. In Toronto, by substituting chlorine for alum at such times as the raw water was physically good, maintenance costs of the drifting sand filters have been reduced by $150,000 over a period of four years. It seems quite unnecessary to apply large doses of alum to a physically good water when increased bacterial efficiency can be secured by small doses of chlorine at a fraction of the cost.

Some criticism has been made of the use of the pre-chlorination process. In view of the fact that extensive experimental work which has been carried out by several state boards of health has resulted in its use in some twenty cities in America, the criticism can hardly be said to be justified. The chief objection has been based upon the claim that chlorine interferes with the filtration process by destroying the surface sand coating. Experimental studies carried out in Toronto showed that when moderate doses of chlorine were applied, the film on the sand grains was not affected. The film consists of colloidal and organic matter and

when tested showed that the sand grains had absorbed alumina hydroxide, which remained on the sand for several weeks regardless of whether alum was applied or not. It was further noted that in moderately turbid water considerable economy in alum could be effected by applying all doses of chlorine and reducing the alum to a dose just sufficient to produce clarification. C. R. Cox, of the New York State Department of Health, has recently reported that pre-chlorination aids coagulation because of the effect of chlorine on organic matter in the raw water, so that the physical state of the stabilizing protective organic colloids is altered or that the organic matter is "aged" by the chlorine through the formation of saturated compounds. Our observations in Toronto, carried out by F. Hannan over a period of five years, certainly confirm the views of Cox.

The clarification of the water when using chlorine with alum, is, if anything, greater than when using alum alone. It is now universally conceded that waters of certain hydrogen-ion concentrations after treatment with alum will pass decomposed alum in colloidal form. The amount of this has been reliably estimated by Hatfield and Hannan and approximates a maximum of one-fifth part of one in a million parts in the Great Lakes water. There is no evidence that pre-chlorination increases the residual colloidal alumina. Theoretical considerations indicate that as increased doses of chlorine raise the hydrogen-ion concentration of the water, the amount of residual alum would actually be decreased to a small extent. Other advantages of pre-chlorination are reduction of filter loading in heavily polluted water, increased rates of filtration, reduced operating costs, and added safeguards in water subject to rapid periodic changes in quality.

Destruction of Algal Growths

Increasing attention is being given to the treatment of water with chlorine for the destruction and prevention of algal growths in filter underdrains and sedimentation basins and for the sterilization of new water-mains. For many years past, copper sulphate has been used for the destruction of algae, and while it still remains the best for treatment of reservoirs, and impounding basins, chlorine is preferable for some other conditions. The application of chlorine to the raw water at Newport News, Va., has been completely successful in preventing algal growths on the walls of the filters, while in Illinois excessive growths of crenothrix in the filter beds and under-drains were destroyed by chlorination. Under such circumstances, it should be pointed out that it is necessary to retain a definite amount of chlorine in the filters for a predetermined period. Chlorination has been successfully practiced for the destruction of growths in filter underdrains in both Europe and America.

Excess chlorine was unsuccessfully tried in Toronto on the slow sand plant in an endeavor to lengthen the filter run. For practically two months in the spring of each year the waters of the Great Lakes are affected by some condition which is usually accompanied by a considerable increase in the microscopic content. The effect of this is to rapidly build up the loss of head and increase resistance to the passage of water through the filters. The microscopic content is partly involved, but as similar numbers of organisms frequently occur throughout the summer months without seriously affecting the loss of head, it is obvious that some other factor also plays a part. Excess chlorine was applied to remedy this condition, and later copper sulphate was tried, but neither improved the situation at all.

The sterilization of new water-mains is extending to all parts of America, and it is probable that in the near future this practice may be made compulsory. The annual report of Sir Alexander Houston on the London water-supply for the year 1925 gave details of the successful chlorination of a house service which had become infected with small worms. Practically all swimming pools are now treated with chlorine, and definite excess of chlorine has to be maintained in the water.

In New York and elsewhere chlorine in large doses has been used to destroy the taste caused by excessive growths of microscopic organisms. It is not known definitely whether the excessive chlorine oxidizes the taste-producing matter or forms a tasteless substitution compound. In view of recent work along other lines, it seems probable that the latter consideration is most likely involved.

Chloramine Better for Some Conditions

The use of chloramine and dichloramine, which consist of a mixture of chlorine and ammonia, was first practiced in the treatment of water at Ottawa, Ontario, by Joseph Race in 1917. The most effective dose of chloramine has been found to be four parts of chlorine to one part of ammonia. Much research work has been carried out recently in England on this substance, chiefly by Major C. H. Harrold and Sir Alexander Houston. It possesses certain advantages over straight chlorine and is said not to cause any taste in the treated water. While laboratory work is being carried out at

Toronto, there are no figures available showing that taste will not result in water polluted with industrial and other waste matters. Chloramine has great sterilizing properties, although the immediate effect is slower than that of chlorine alone, but it has the added advantage that it possesses certain potential sterilizing powers not possessed by chlorine. In cities troubled with aftergrowths in the mains or troublesome spore-forming bacteria, the use of chloramine has great possibilities. In waters where high doses are applied, economy might be effected by using chloramine. The writer does not know of any installation where chlorine and ammonia are being jointly applied in gaseous form.

Removal of Taste in Water

Probably by far the most important question of the present day is that of taste following the application of chlorine to water. This condition can be said to be world-wide in extent; and while in many cases the reasons are known, there are probably a great many instances where the cause is a matter of conjecture. It is strange, however, that while chlorine is the direct cause of the taste, this same reagent can be effectively used to destroy taste-forming substances. Generally speaking, the worst taste occurring in chlorinated water is caused by small doses of chlorine. By slightly increasing the chlorine beyond the taste-producing dose, the conditions become worse, but beyond a certain figure, which in all cases can be determined, the taste improves and subsequently disappears. It is perhaps unfortunate that the taste zone is very close to the normal dose of chlorine applied in many cities and towns, thus explaining the frequency of taste in many localities.

It is not within the province of this article to discuss the causes of taste in water. These causes of taste, however, may be divided into two groupings: the first is the taste caused by an excess of chlorine due to overdosing; and the second is a distinct chemical taste resembling iodoform. The cause of the latter condition is the formation of substitution compounds, the chlorine acting upon substances of unknown origin, organic matter or other industrial wastes containing coal tar derivatives. Tastes due to excess chlorine alone can be remedied by controlling the dose according to accepted practice, but the treatment of the chemical taste in water involves a study of the actual causes and determining the most suitable method for counteracting the condition.

Superchlorination and Dechlorination

Recent researches carried out on behalf of the city of Toronto by Howard and Thompson have thrown a great deal of light on the subject of taste prevention. The outcome of this work was the adoption of a superchlorination and dechlorination method. While the treatment by excess chlorine was reported on by Sir Alexander Houston in England, the first large application was successfully carried out in Toronto, where over 70,000,000 gallons of water was treated daily for a period of three months. Exhaustive experimental work was carried out over a period of three years, and much new information as to the controlling factors was reported. It was ascertained that the amount of excess chlorine required to destroy taste was directly proportionate to the amount of taste-producing matter present and that a definite time contact period was necessary. Too little chlorine or insufficient time contact renders the treatment ineffective. Regardless of the nature of the taste-producing matter present, the experimental work demonstrated the effectiveness of the superchlorination method. In Toronto, 12.5 pounds of chlorine per million gallons were applied, and after 1¼ hours' contact the residual chlorine, amounting to approximately 4.6 pounds, was removed by sulphur dioxide which was applied through vacuum pedestal machines. Some of the conclusions reached as a result of the Toronto work were as follows:

1. While phenol is contributory to the production of taste, there are also other causes of unknown origin.

2. Decomposing organic matter may form phenoloid bodies and cause taste in chlorinated water.

3. A large group of substances examined, derived from the destructive distillation of coal, phenol, cresol, anisole, and xylenol, produced an iodoform taste and odor in the presence of free chlorine.

4. The formation of substitution compounds causing taste in chlorinated water can be prevented by the excess chlorine and dechlorination methods.

5. Definite time contact periods are necessary for varying doses of taste-producing substances to effect their destruction. Such contact periods can be shortened by greatly increasing the chlorine dosage.

6. Under heavy discharge conditions, sulphur dioxide requires considerably more heat than chlorine to maintain cylinder pressure.

7. The effective chlorine dosage to detroy taste must be separately determined on each supply involved.

Effect of Cold Water

In the fall of the year, it was noticed that slight taste developed following the super-

chlorination treatment, which resulted in further experimental work being carried out. It was found that with a drop in water temperature below 42 degrees, greatly increased applications of chlorine became necessary, the effective dose increasing to 2 parts per million for mechanically filtered water and 1.5 parts per million for the slow sand filtered water. Operating conditions have clearly shown that some other factor interferes with the effectiveness of the treatment under cold-water conditions. Residual chlorine studies showed that this condition was seemingly not involved. Actually, the figures indicated a decreased rate of chlorine absorption and a necessary increase of sulphur dioxide for complete removal of excess chlorine. It seems highly probable that the decreased biological activity in cold water prevents the natural destruction or prevention of phenolic bodies in the raw water. Consequently, the phenolic concentration is greater and a large amount of chlorine is required.

When using excess chlorine, the practice of pre-chlorination was abandoned, as it was found to interfere seriously with taste destruction. After 30 minutes' contact in the mechanical filters, the residual chlorine was so reduced in quantity that an insufficient amount remained. As it was found impossible to regulate the dose to meet varying conditions, the treatment was discontinued. In testing superchlorinated water for residual chlorine under cold-water conditions, at least ten minutes' contact with ortho-tolidin solution is necessary to insure correct readings. Improvements in maintaining pressure of liquid sulphur dioxide under high discharge conditions has been effected by placing steam coils between the cylinders.

One observation made in Toronto should be mentioned. This has reference to the determination of free chlorine by the ortho-tolidin method and is of considerable importance. It was found that sunlight seriously interfered with the production of color; and if correct results are desired, samples of water being tested should be protected from sunlight when the ortho-tolidin solution is added. Otherwise an error as high as 70 per cent may be recorded.

ACKNOWLEDGMENT.—From a paper read before the Canadian Section of the American Water Works Association.

The Electrically Operated Pumping-Station, Kansas City, Mo.

By E. W. Harvey

THE city of Kansas City, Mo., is now completing a new municipal water-works costing approximately $11,000,000 and containing three electrically driven pumping-stations designated respectively as the low-lift, the secondary, and the East Bottoms. The raw water from the river is pumped into the low-lift station and then into the purification works. Here the water flows by gravity through the various processes until it reaches the clear-water basin beneath the filters. From here it is pumped in the secondary station through the tunnels and pipe lines to reservoirs at the two high-pressure pumping-stations. The station known as the East Bottoms pumping-station is a high-head station and assists the existing high-head station in pumping water directly into the city mains and reservoirs.

The three new stations are electrically operated and completely equipped with Westinghouse apparatus. The low-lift and secondary stations use power at 2,300 volts, 3-phase, 60 cycles for the main pump motors, while the East Bottoms pumping-station uses power at 13,200 volts, 3-phase, 60 cycles.

The low-lift station has four 35,000,000-gallon-per-day pumps with one unit provided with a 20,000,000-gallon-per-day impeller. These pumps are driven by 400-horsepower synchronous motors, 100 per cent power factor, the excitation for the motors being supplied by two motor generator sets of 30-kw. capacities. One set is capable of exciting the full load, and the other is used as a spare. This station is large enough to house a fifth unit if necessary.

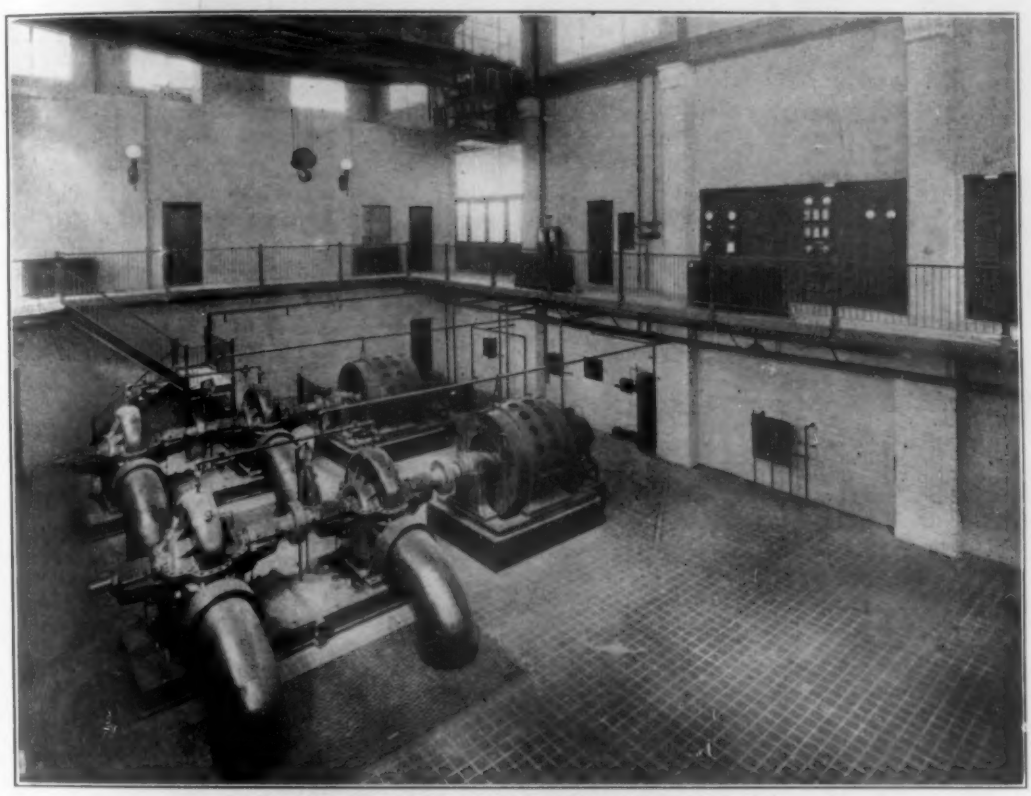
A 14-panel asbestos switchboard controls the station. The system is mechanical remote control through pull-rods and bell-cranks. Motor starting is effected through a compensator and starting bus. The bus is sectionalized by disconnecting switches, and two compensators, one in each section, provide the starting voltage. The main bus is sectionalized by two oil circuit-breakers. In the section between these breakers there is a station service feeder which serves power, lighting and heating transformers. Each section of the main bus is fed by an incoming line. One section feeds two motors, while the other is designed to feed the remaining two and also the future unit. Each incom-

ing feeder has enough capacity to feed the entire station. The building is heated by electric radiators which obtain their power from a 150-kv.-a., 3-phase, 60-cycle transformer applied to the heating circuit. The auxiliary equipment, including exciter motor generator sets, vacuum pump motors, sump pump motors, etc., is operated at 220 volts, 3-phase and is supplied by three 25-kv.-a. and one 15-kv.-a. transformer for this service.

The secondary station is a duplicate of the longer and comprises 21 units. This station is not heated by electric current.

Outdoor Substation

The 2,300-volt power for the above-mentioned station is obtained from the Kansas City Power and Light Company at 13,200 volts and stepped down by an outdoor substation which is the property of the city of Kansas City, Mo. The substation consists of two banks of transformers connected delta. Each transformer is rated at



EAST BOTTOMS PUMPING-STATION, KANSAS CITY, MO.
This illustration shows two 24,000,000-gallon-daily pumps driven by 2,000-horsepower Westinghouse motors. Ultimately six pumps will be installed in this station

low-lift in its main pumping units, but contains additional equipment of minor importance. For example, there are three 2,500-gallon-per-minute wash-water pumps, driven by 2,300-volt, 75-horsepower motors, and two 500-gallon-per-minute pumps and one 250-gallon-per-minute pump. The house pumps are driven by two 60-horsepower, 2,300-volt, and two 50-horsepower, 220-volt motors. There are two station service feeders instead of one as at the low-lift station, one feeder for power and the other for lighting. Power is supplied by four 75-kv.-a. transformers supplying the station service and one 8-kv.-a. constant-current transformer for street lighting. The switchboard is necessarily

833 kv.-a., 13,200 primary and 2,200 volts secondary, single-phase, 60-cycle. These transformers are oil-immersed and self-cooled.

The station is fed by two 13,200-volt feeders, one overhead and one underground, forming a loop and protected by directional relays. Each bank of transformers is controlled by an oil circuit-breaker on the high-tension side and one on the low-tension side. There is a tie breaker between the two incoming lines. This breaker will normally be open. The high-tension breakers are of the outdoor type, rated at 25,000 volts and arranged for automatic tripping. The low-tension breakers are rated at 7,500 volts, are placed in switch-houses, and

have automatic features similar to the high-tension breakers.

The East Bottoms Station

The East Bottoms station has two 24,000,000-gallon-per-day pumps operating against a total head of 380 to 390 feet, and each unit is made up of two single-stage pumps connected in series. They are driven by synchronous motors whose ratings are 2,000-horsepower, 80 per cent leading power factors, 13,200 volts, 3-phase, 60-cycle, with direct-connected exciter and a speed of 720 r.p.m. The station is intended to consist ultimately of six pumping units.

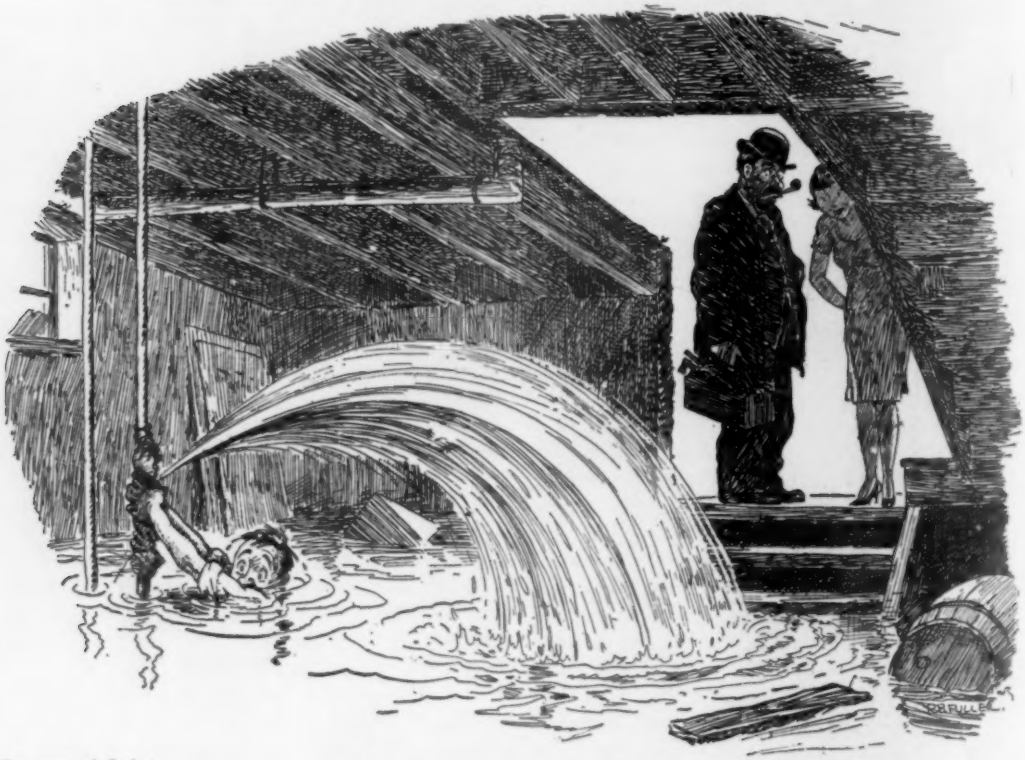
The asbestos type switchboard contains fourteen panels. The control is an electrical remote type with semi-automatic operation, only certain operations being performed mechanically and others automatically through relays and interlocks.

There are two incoming feeders connected through double throw switches to duplicate buses. Compensators and a starting bus are used at this station as in the others. In addition, there are neutral breakers for short-circuiting the compensator windings so as to reduce the inrush on the motors when full voltage is applied. The main bus breakers are rated at 15,000 volts, 400 and 600 ampere. There are eight of these breakers in the station. In addition, there are two neutral and two starting breakers, all controlled by direct current, for which a battery is provided. This station has a 30-kw. motor generator set which supplies excitation to either or both of the 2,000-horsepower motors in case of failure of the direct-connected exciters, and also supplies the station with a source of light in the event of failure of the lighting transformer. It gives a full charge to the storage battery and feeds the direct-current control bus when the battery is not in service.

The small motors for driving auxiliaries, just as in the other stations, are fed from a bank of transformers. In this station there are three 25-kv.-a., 13,200-volt primary and 230-volt secondary transformers. The lighting transformer is a 25-kv.-a., 13,200-volt primary and 230- and 115-volt secondary.

Flat Rates Drowned Out

Incident in the Life of a Husband Who Neglects Little Leaks Because His Town Maintains the Old Flat-Rate System of Charging for Water



Courtesy of Judge

VOICE FROM UPSTAIRS—"IT'S ALL RIGHT, DEAR, THE PLUMBER HAS COME"

Police and the Causes of Crime

By Louis Brownlow

CHIEFS of police representing all the states in the Union but three in convention in St. Louis adopted a resolution in which they set out by unanimous agreement the causes of crime as they see the problem. The causes of crime in the opinion of these chiefs of police, in the order of their importance are: first, alcohol; second, want of proper home training; third, destitution of children; fourth, ignorance; fifth, extravagance in dress; sixth, the brothel and the gambling house; seventh, pernicious and immoral books and periodicals.

This list of causes of crime was presented by the Warden of the Missouri State Penetentiary, who said that since the war there had been a marked increase in crime among the very young, and that one-fourth of the inmates of the prison over which he presides were youngsters of twenty-one or less.

The Chief of Police of St. Louis gained the endorsement of the convention by his statement that "politics should never enter a police department; no appointment should be made for political reasons or effect, nor a removal for the same cause."

The Governor of Missouri and the Mayor of St. Louis, as well as chiefs of police from all over the country, in addressing the convention, while disagreeing as to many details, all agreed in the one main point that the causes of crime were to be found in the effect of certain existing institutions upon the young people of the country, and that the attack on crime must be made among the young.

Statistics showing that a greater proportion of crime came from among young people having no proper home training, or those who were without homes, or without one or both parents, the convention adopted a resolution urging the adoption, by the community, city or state, of every destitute or neglected child.

More importance was given to this problem of the neglected child than to any other feature of the convention, and the recommendation of community responsibility for all children not having proper home influences and surroundings was adopted as the first and most pressing need for police work in the country.

Five other things were deemed necessary by the chiefs of police to make their work more effective. Counting the public guardianship of children as first, these were: second, a systematic plan of transmitting detective information throughout the country without the necessity of each city's telegraphing or writing independently to every other city; third, control of the social evil; fourth, an exchange of photographs of criminals; and, sixth and last, a uniform system of rewards for the capture of criminals.

Only on the method of the control of the social evil was there any great difference of opinion among these leaders of the battle against crime.

They all agreed that since the recent war there had been much more crime, and that the juvenile crime situation was especially alarming, and that unified action by all parts of the governmental establishment, with the elimination of petty politics, was necessary to make any anti-crime campaign successful.

This was the first convention of chiefs of police ever held in the United States. There were one hundred and thirty delegates there. They represented thirty states, all but three of the states in the Union.

For this convention was held in St. Louis in October, 1871, fifty-six years ago, come next fall!

The war they were talking about wasn't the World War, but the Civil War. The intemperance they were talking about wasn't of the bootlegger, but of the licensed saloon. The social evil they were talking about wasn't of the motor car and the roadhouse, but of the licensed, supervised, medically inspected segregated district.

The "neglected and abandoned youth" they were talking about, the hordes of orphans and half-orphans who roamed the streets of American cities then as they did a year or two ago

High Lights from a Notable Conference of Chiefs of Police

All but three of the states of the Union had delegates at the important meeting described in this article. Whether your city was represented or not, this report will be of exceptional interest to you, for reasons which will be evident when you read Mr. Brownlow's analysis of what happened.

This article is copyrighted by and published through the courtesy of Current News Features, Inc., of Washington, D. C. It is No. LXX of the syndicated series entitled "Live Letters from an Expert on Municipal Problems."

the streets of Moscow, picking up their livings from trash-barrels, and sleeping on cold nights, as the chiefs of police said in that convention, in the police station; they were victims of a graver situation than we can now imagine.

There was no segregation of juvenile offenders then, and for the slightest crimes they were sent at the tenderest ages to the state penitentiary. So said Governor B. Gratz Brown of Missouri, and Mayor J. W. Brown of St. Louis, and Warden W. J. Dougherty of the Missouri State Prison, to that convention.

This convention was the work of a far-seeing and able chief of police, James McDonough of St. Louis. Before it was held he obtained information from all European countries through the State Department. He wrote to the governors of our states, but most of them replied that they had no statistics of crime in cities—just as they would have to reply today.

The point is that there was a crime wave, and a juvenile crime wave at that, in this country fifty-six years ago, and that the heads of police departments were then striving to do something to obtain united police action in an effort to relieve the situation.

Little has been done in that period of fifty-six years to bring about the unity of police action then so much desired, but the facts, apparent to any one who will read in full the report of that first convention of police chiefs of America, are that crime and vice and troubles of all sorts have greatly diminished in this country, despite our tremendous growth in numbers, in wealth, and in the complexity of our institutions.

Pedestrian Traffic—Regulation and Enforcement

TO serve as a clearing-house for information affecting the pedestrian as a part of the highway transportation stream, both on congested areas and on rural highways, is the object of the Committee on Pedestrian Traffic—Regulation and Enforcement, of the National Highway Traffic Association. At the Association's recent annual convention in New York the committee submitted a "semi-final report," the recommendations of which are here published.

In its introductory statement the committee gave special emphasis to the importance of teaching pedestrians how to help themselves. For instance, "It is quite evident," says the report, "that such recommendations as those listed under the heading 'The Protection of the Pedestrian at Uncontrolled Intersections' are going to be quite ineffective if they are simply added to existing law. They might even do positive harm by giving the pedestrian a false sense of security. *Better pedestrian conduct is going to depend almost entirely upon the magnitude and the effectiveness of the educational measures instituted. And these are dependent for their very start, upon sizeable appropriations by the official body.*"

Sufficient police personnel is not likely to be available for many years to come to secure any widespread enforcement of such regulations. The committee has, however, attempted to codify such measures as seemed to it desirable. It is felt that these represent the best practice in the light of present knowledge. Some of them can be, and should be, enforced immediately. A start must be made some time. The others form a basis for the educational work that the committee feels is of prime importance. The recommendations follow:

RECOMMENDATIONS

1. The Necessity for Pedestrian Regulations

The time has come when all classes of street users (including pedestrians) must be subjected to moderate and reasonable regulations in order that all may benefit through the reduction of accidents and the relief of congestion, and that the pedestrian may have a reasonably convenient, comfortable, and dignified use of the streets.

2. The Protection of Pedestrians at Uncontrolled Intersections

The committee has been unable to agree upon a recommendation which it believes will give the pedestrian the much-needed protection, without at the same time introducing other undesirable features. (See appendix.)

3. The Regulation of Pedestrians at Controlled Intersections

a. At intersections controlled by officers or light signals, pedestrians should be educated to be governed by the indications given by the officer, or controlling device, provided that where such pedestrian control is to be enforced, an adequate educational campaign shall have preceded the enforcement, and sufficient police officers shall have been secured to really enforce it.

b. Pedestrians moving with the traffic should have the right of way over turning vehicles.

4. The Protection of Pedestrians at Controlled Intersections

a. At controlled intersections an interval should be provided during which no vehicular traffic

should enter the intersection. On light signals this interval is indicated by the amber light. This interval should be of sufficient length to allow for a complete pedestrian crossing. On streets 100 to 150 feet wide this would be interpreted to mean crossing to a safety zone or zones constructed so as to afford adequate protection for the pedestrian. This interval should be capable of variation with the amount of pedestrian traffic, to the end that the pedestrian be afforded a dignified crossing, as well as to enable the roadway to be practically cleared of pedestrians before vehicular traffic begins to move. *The pedestrian should in turn be instructed not to enter an intersection while the amber light is burning, nor to crowd off the curb while waiting for a change in the light.*

b. Definite crosswalks should be marked at all controlled intersections.

3. At certain heavily traveled intersections all turns, including the right turn, should be eliminated in order to facilitate pedestrian crossing. The effect of such elimination on vehicular traffic flow should first, however, receive very careful consideration.

5. The Regulation of Pedestrians Between Intersections in Districts Subject to Traffic Control

In certain business districts, crossing other than at crossings should be prohibited and violations punished, *provided* that an adequate educational campaign be first conducted, and that sufficient police personnel be first provided to enforce any such provisions adopted. The committee recommends that *the word "discouraged"* be substituted *for "prohibited and violations punished" until such time as a given municipality actually has sufficient police personnel for positive enforcement.*

6. The Regulation of Pedestrians Between Intersections in Districts Not Subject to Traffic Control

The committee feels that this phase of the problem can better be handled by educational than by regulatory methods. It recommends:

(a) The further extension and improvement of playground systems so that they be made sufficiently accessible and attractive to cause children to play in them rather than on the street.

There should be at least a playground to every school.

(b) The extensions of safety instruction in the public, private and parochial schools and young citizenship organizations, such as Boy Scouts, Girl Scouts, Y.M.C.A., Y.M.H.A. and other clubs, with particular emphasis on the street traffic hazard. A further effort should be made to cause this instruction to carry over into the home.

(c) An extension of educational effort on the part of the official traffic control body through the medium of prize essay contests, newspapers, motion pictures, radio, billboards, posters, expositions, parades, campaigns, traffic talks to be used as insert slips in packages, talks by uniformed officers in the schools and before public gatherings, etc. Such educational efforts should be directed at the adult as well as at the child in order not only to secure better traffic conduct on the part of the adult, but also in order to supplement the school influence for traffic safety by the home influence. The parent must be brought to teaching the child that the roadway is dangerous, as thoroughly and at as early an age as they teach it that fire burns.

(d) The more rigid enforcement of reasonable speed limits on the part of the motorist in the congested residence districts.

7. The Expedition of Pedestrian Travel

(a) Sidewalk encroachments such as stoops, projecting showcases, fruit stands, piled-up merchandise, needless poles, etc., should no longer be permitted. Existing laws of this character must be more adequately enforced.

(b) Pedestrians should be instructed when stopping to do so near the building line or curb, and loitering should be discouraged in certain of our business districts.

(c) An educational effort should be undertaken to show pedestrians the added convenience to themselves of a more orderly traffic movement, such as keeping to the right, etc.

(d) Advantage should be taken of new buildings, subway construction, etc., to provide a more adequate way for pedestrians, through the medium of arcades, underground sidewalks, etc. Consideration should be given to the restriction of certain streets to pedestrian traffic only—as in downtown New York.

8. The Pedestrian on Rural Highways

Sufficient right-of-way should be secured to eventually provide for pedestrian pathways on rural highways. Until such pathways are constructed, educational efforts should be made to cause pedestrians to walk on the left side of the road facing oncoming traffic. They should also be encouraged to carry a light when walking at night.

9. The Enforcement of Pedestrian Regulations

(a) Pedestrian control should be attempted only after a thorough and adequate campaign of public education.

(b) In regulating pedestrians, arrests should be made at this time, only where malice is indicated. Obedience should be secured primarily by warning and calling attention to the violation.

(c) Consideration should be given to the possibility of modifying the period of the day during which traffic officers, particularly motorcycle men, are on the street, looking toward the employment of all of the already available motorcycle officers during the evening peak hour and early evening.

EDITORIAL NOTE.—The members of the committee submitting the foregoing report are: Prof. Lewis W. McIntyre, Chairman, Consulting Highway and Traffic Engineer, University of Pittsburgh, Pittsburgh, Pa.; Prof. Arthur H. Blanchard, President, National Highway Traffic Association, Toledo, Ohio; Morgan A. Collins, Superintendent of Police, Chicago, Ill.; Frank L. Duggan, Assistant General Manager, Consolidated Ice Company, Pittsburgh, Pa.; Thos. Fitzgerald, Vice-President, Pittsburgh Railways Company, Pittsburgh, Pa.; Alvan Macauley, President, Packard Motor Company, Detroit, Mich.; Wm. E. Metzger, Vice-President, Federal Motor Truck Company, Detroit, Mich.; Miller McClintock, Director, Erskine Traffic Research Bureau, Harvard University, Cambridge, Mass.; James Sinke, Director of Public Safety, Grand Rapids, Mich.; Albert W. Whitney, Acting General Manager, Bureau of Casualty and Surety Underwriters, New York City.

The "Recommendations" here published are supplemented in the committee's report by an appendix and by numerous tables. The complete document can be obtained in mimeographed form by addressing the Chairman.

Is Super-Congestion Inevitable?

HOW long will the small cities, and even the villages, of America continue to tolerate—if not actually to encourage—the evils of land exploitation and overcrowding with which our larger cities are beginning, too late, to struggle?

Various aspects of this problem received consideration at three important national gatherings last month. These meetings, all held in Washington, were the annual conventions of the Chamber of Commerce of the United States, the National Conference on City Planning, and the American Institute of Architects. While the three groups approached the subject from quite divergent points of view, general recognition of the seriousness of the problem was apparent from the discussions which took place and from the reports and resolutions adopted.

As indications of what New York may be coming to if the super-congestion theory of metropolitan development ultimately triumphs, THE AMERICAN CITY presents on the next four pages some recent proposals for "solving" the present conditions of intolerable congestion in the streets of New York. Such schemes may be a fine sort of thing—for those who like that sort of thing. It may be that New York can render a real service to the rest of the nation by diverting funds which normally would go for schools, playgrounds, waste disposal, and other urgent needs of a wholesome civic life, into multi-deck streets and multi-million-dollar subways; for the result may prove valuable in furnishing an awe-inspiring example of what not to do in municipal development. But that there is any fundamental economic or social need for such super-congestion, even in New York, we cannot believe.

What is your city doing about it?

NATIONAL CONFERENCE ON CITY PLANNING

Resolution Adopted by Eighteenth Annual Convention, May, 1927

WHEREAS, Concentration of high buildings in a limited area or excessive cubage or bulk of occupied space in buildings causes unwarranted and expensive traffic congestion, interferes with light and air of neighboring buildings, and in other ways is detrimental to a balanced and wholesome development of the community;

RESOLVED, That this Conference urges that all state and local authorities who have control of municipal development place and enforce strict limitations upon building heights when excessive heights would prove a detriment to the orderly development of the city or any part thereof; and

RESOLVED, That such limitations are especially necessary in the National Capital, where the dignity and impressiveness of public buildings may be injured unless appropriate standards for the development of private property are set and maintained. Having in mind the importance of maintaining the dominance of such national structures as the Capitol Dome and Washington Monument, the Conference urges Congress and the municipal authorities to limit strictly the height of buildings in the Federal City.

CHAMBER OF COMMERCE OF THE U. S. A.

From Report by Civic Development Chairman at the Chamber's Fifteenth Annual Convention, May, 1927

We had a lively debate between two New Yorkers [Harvey Wiley Corbett and Henry H. Curran, followed by Arthur S. Bent, of Los Angeles, and Fred E. Reed, of Oakland] on the subject of skyscrapers. In view of the increasing number of skyscrapers and the laudation of the wonderful skylines they are said to produce, I was surprised to find that the overwhelming opinion of the speakers was against them. . . . Both debaters admitted the necessity for regulating, not the height, but the bulk of buildings—for both are believers in tower buildings and both pointed out the advantages in terms of light and air if buildings are separated by stepping back as they go up.

The meeting was definitely designed not to lead to resolutions, for the subject is one that calls for further study and perhaps for varied application in different cities. But one resolution bearing upon the underlying purpose of the meeting was offered and adopted. It asks that the United States Chamber of Commerce call the attention of real estate subdividers, city officials and others connected with the development of our cities to the need for recreational areas which should be located in accordance with a comprehensive city plan and should be readily accessible to all sections of the community.

AMERICAN INSTITUTE OF ARCHITECTS

Resolution Adopted by Sixtieth Annual Convention, May, 1927

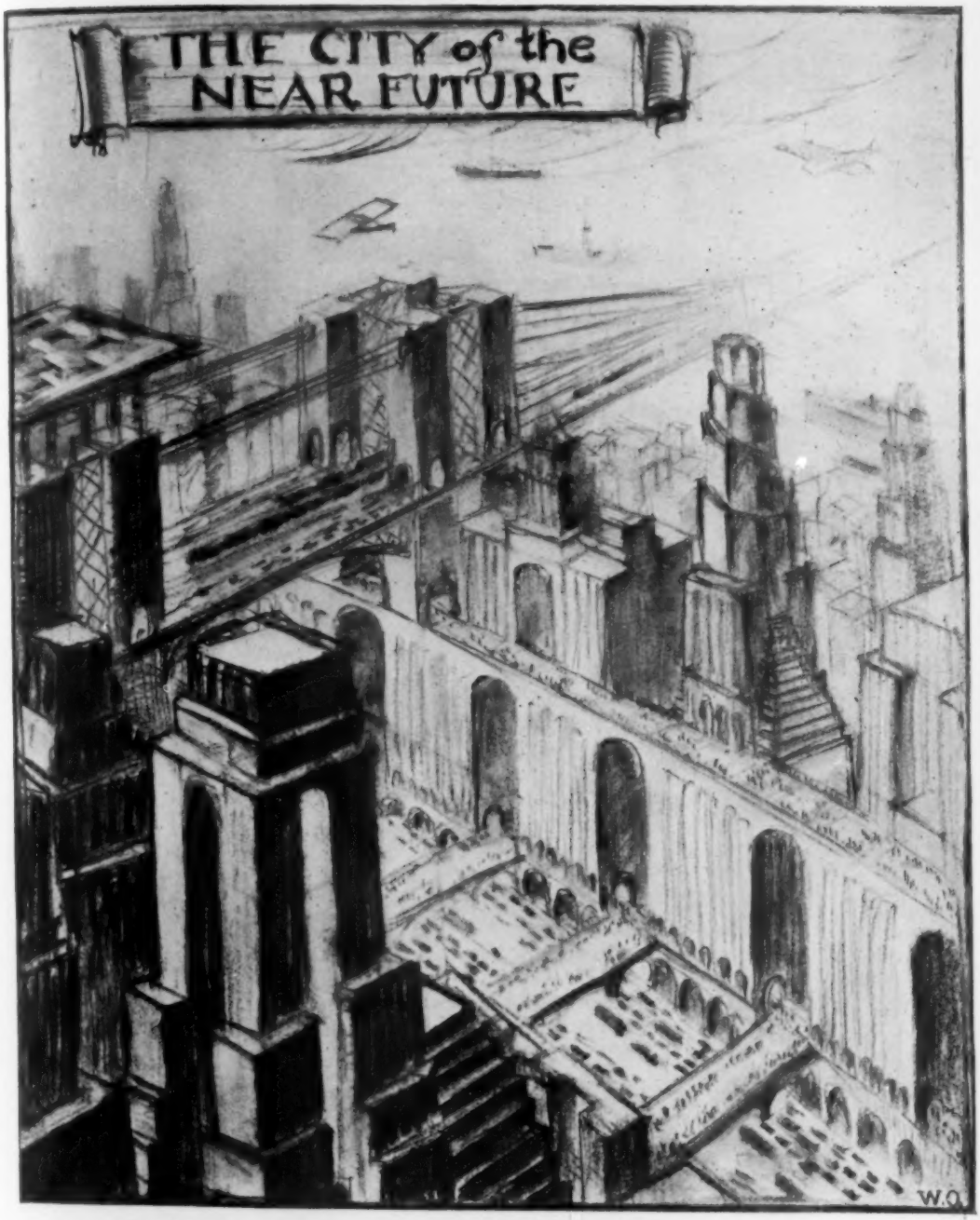
WHEREAS, The American Institute of Architects, through its Community Planning Committee, and in special meetings and conferences, has come to the belief that the best advancement of the interest of our cities, the effective application of city planning principles, and the improvement of the conditions that affect the daily practice of architecture are alike jeopardized and hampered by present methods of land exploitation; and

WHEREAS, It is our belief that little improvement is possible unless methods of regulation are contrived which will relate the subdivision of land to the needs of the community and to the prescribed functions to which the land is to be devoted; and

WHEREAS, We believe that it is high time to take action which shall result in altering the present basis of land exploitation and direct it towards the improvement of our communities; therefore, be it

RESOLVED, That the Institute, through its Committee on Community Planning, make special study of the problems of land development and regulation, and report its findings to the next convention.

Must We Come to This?

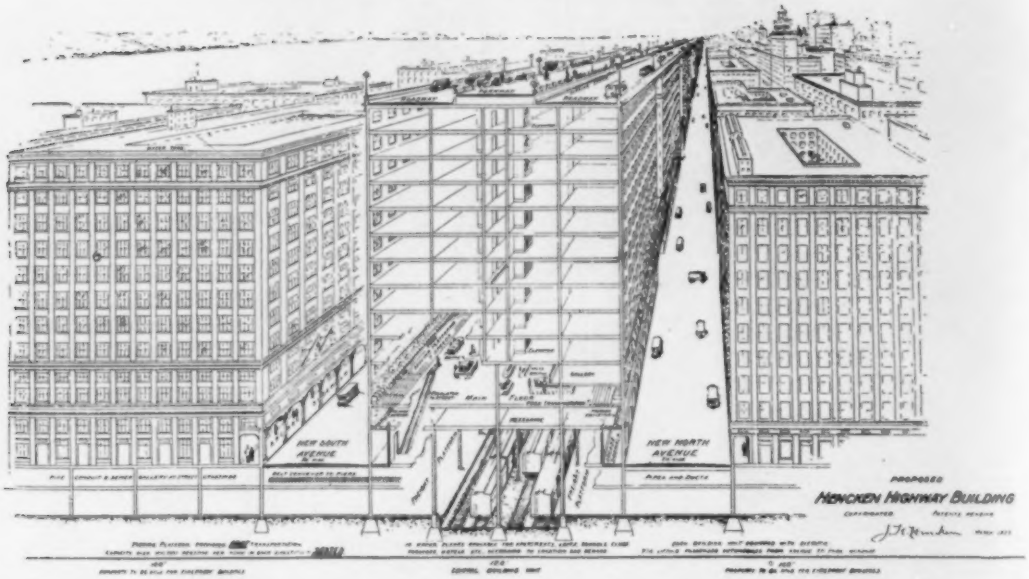


A VIEW IN THE NEW YORK CITY OF THE NEAR FUTURE AS VISUALIZED BY HARVEY WILEY CORBETT, ARCHITECT, FORMER PRESIDENT OF THE ARCHITECTURAL LEAGUE OF NEW YORK

As interpreted by Hamilton Wright: "Elevated sidewalks, Gargantuan skyscrapers that would make the pyramids of Egypt picayune beside their colossal bulk, bridges connecting their cloud-piercing tops, airplane landings 500 feet above a seething man-made canyon—America materialized in an age of steel—man's nearest approach to nature's most striking work of architecture, a mountain range! A riot of color—green, yellow, red, blue, and scores of multi-colored buildings in the city of the future, feature this amazing drawing"

(Other amazing proposals for multi-level transportation in New York are described on the following pages)

And How About This?



The Henckenway—An Urban Microcosm

Unique Proposal Includes Provision for Free Transportation

A PROJECT constituting a radical departure from prevailing customs in transit, traffic, freight distribution, and housing has been announced by John K. Hencken, an engineer in New York City. This contemplates a structure of 6 to 12 stories, according to topography and intensity of land use, extending from lower Manhattan to Yonkers, some 16½ miles, continuous except for street intersections, which, however, are bridged over at several levels. A sub-basement is supplied with railroad tracks and freight-handling facilities; the roof carries a motor boulevard, with a parkway separating the north-and-south roadways. The second story would carry two noiseless moving platforms—one in each direction—each made up of seven longitudinal sections traveling at speeds ranging from three miles per hour for the first to twenty-one miles per hour for the seventh, the latter to be furnished with seats and have a capacity of nearly 200,000 people per hour past a given point. The various floors of the structure would contain shops, restaurants, offices, light manufacturing, wholesale businesses, apartments, hotels, and even schools, churches, and theaters, depending upon the character of the neighborhood through which the structure runs.

In some ways this idea is reminiscent of "Roadtown," a proposal made over ten years ago by Edgar Chambless. His plan was to build a city as a continuous longitudinal structure through the open country, with underground train service and with a boulevard on the roof; the houses to have gardens adjacent, and farms and forests directly in view. This proximity to nature was the central motif, and rapid transportation was the key. With the Henckenway, pushing through a great congested city, the emphasis is on economic features; the dominating factor again is transportation.

The Non-Stop Moving Platform

The most vital and arresting feature of the plan is the moving platform. This in itself is no new idea, but the combination of the platform here proposed, described as a complete departure from any system hitherto used, with the long mileage, the relatively high speed and the freedom from fare paying, is distinctive and might conceivably be revolutionary as regards rapid-transit development in New York and elsewhere. In effect, the entire long-drawn-out structure would constitute one continuous subway—or elevated—station, whereby a passenger could get aboard at any point, and travel without a stop to any other point where he might wish to get off. The cost of operation

both as to power and "platform labor" would be very low.

The Structure as Proposed for New York

While the Henckenway is being planned for a number of possible routes in New York and elsewhere, including Atlantic Avenue, Brooklyn, the immediate project is for the West Side of New York City, and an attendant civic advantage hoped for is an agreement for the elimination of railroad tracks on and near the river front, their function to be taken over by the trackage and freight facilities of the Henckenway.

A very attractive estimate of construction cost as compared with probable rentals is presented—$660,000,000 for land and buildings, and $295,000,000 annual rental. Legislative authority for the right of condemnation is essential, to supplement private purchase of land. By acquiring a strip some 450 feet wide, including 100 feet for buildings and 50 feet for a roadway on each side of the structure, itself 120 feet wide, through the long east-and-west blocks north of Fourteenth Street, Manhattan, it is expected that the cost of the land would be largely recouped by later sale of the outer 100-foot strips, at enhanced values. Mass production of the buildings is also counted upon to keep the total cost down. The free transportation is relied upon to attract tenants for the buildings, and its cost would be absorbed by the revenues from the latter, which are alleged to be conservatively estimated. Amortization of the investment in twenty years or less is indicated, after which it is proposed to transfer the entire property to the city, free and clear.

And This?

Dr. John A. Harriss Proposes Six-Deck Streets

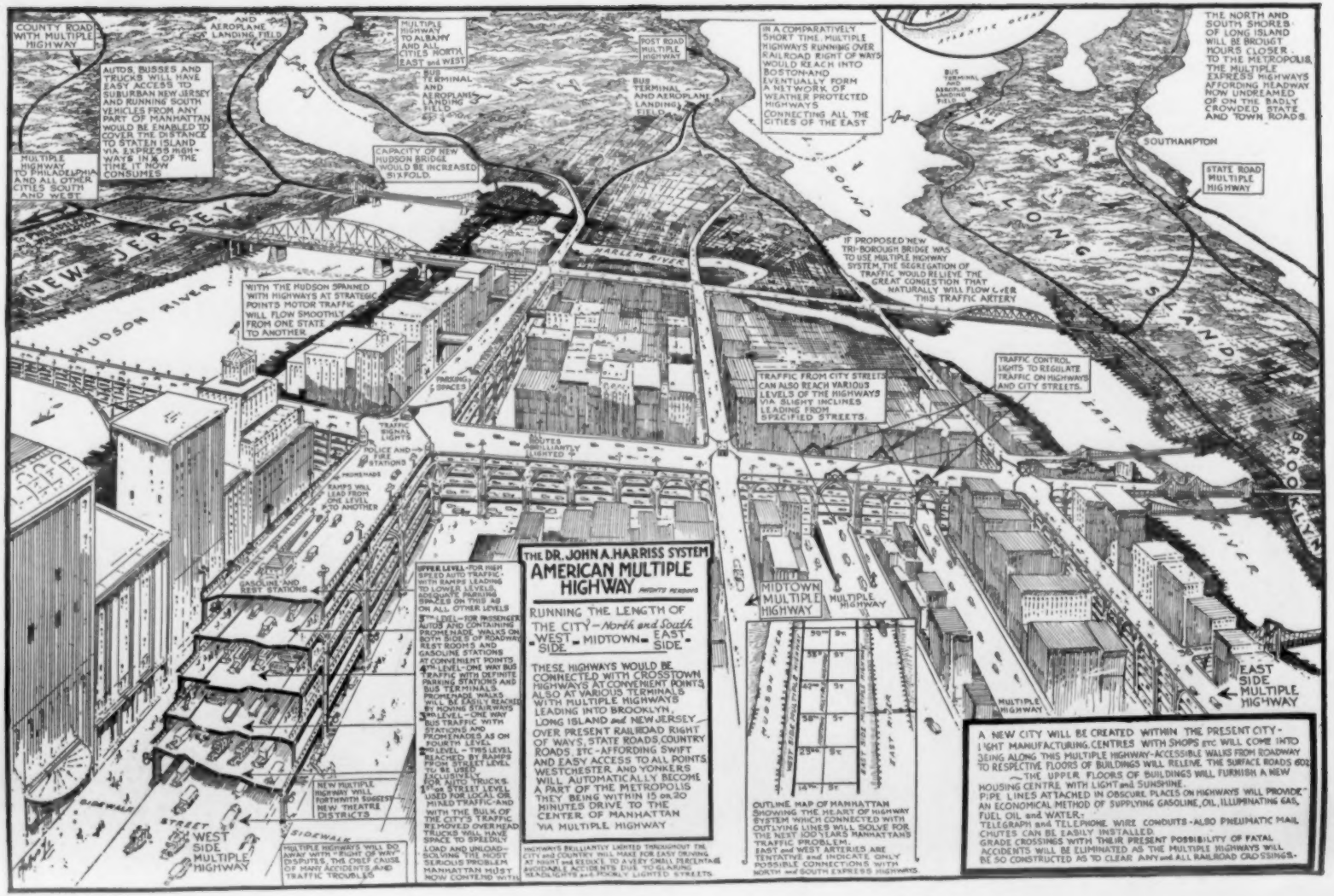
ANOTHER plan recently announced to relieve traffic congestion, and also claimed by its author to be a cure rather than mere relief, is that of a "multiple highway" of six levels, put forward by Dr. John A. Harriss, former Special Deputy Police Commissioner in charge of traffic in the city of New York for a period of eight years, and, by recent appointment of Mayor Walker, Chairman of the Sub-Committee on Traffic Regulation and Street Uses of the City Committee on Plan and Survey.

As shown by the drawing reproduced herewith, the upper level of the structure is for high-speed automobile traffic; the fifth level is for passenger cars; the fourth and third levels for one-way bus traffic; the second level for motor trucks; and the first or street level for local or mixed traffic. The four upper levels contain sidewalks or promenades—in addition, of course, to the sidewalks at the street level, on each side of the structure itself. The top level is shown provided with gasoline and rest stations. Parking is permitted on all levels. There are ramps to enable cars to move from one level to another, and moving stairways for pedestrians to do likewise. The plan is stated to provide for flexible or elastic pavements and sidewalks; and to permit of providing moving sidewalks if found desirable.

The tentative layout of these highways, according to the drawing, includes three of them running north and south on Manhattan Island, connected by similar cross-town highways on some of the principal streets, and continuing along the Albany and Boston post roads. Bridges across the Hudson and East Rivers are shown constructed on the same principle and forming part of the system. The intersections of the arterial and cross-town highways as shown apparently involve the crossing of the various classes of traffic each at the same level, necessitating traffic signal lights, which the plan provides. The cross-town structures also are shown as carrying, at their top level, traffic signal lights for the existing north-and-south highways on the surface.

In describing his plan and its advantages, Dr. Harriss says:

"This new plan contains some of my previous suggestions and embodies many new and up-to-date indications for traffic control with traffic signal lights, together with adequate bus terminals, bus stations, parking accommodations, temporary highway garage facilities—in short, a comprehensive plan providing for the solving of the traffic problem together with a practical method of preparing for the future growth in any and all communities. . . . The plan suggested may be readily installed not only in or along main highways or streets, but in cross-streets or highways as well, and may be extended at a practicable and commercial cost throughout the country so as to provide a network of *weather-protected self-ventilating highways*, connecting all the larger communities as well as opening up unlimited areas within short distances of existing large cities and towns, which areas are now more or less dormant. Another important advantage is that the same


COUNTY ROAD WITH MULTIPLE HIGHWAY
AND AEROPLANE LANDING FIELD
AUTOS, BUSSES AND TRUCKS WILL HAVE EASY ACCESS TO SUBURBAN NEW JERSEY AND RUNNING SOUTH VEHICLES FROM ANY PART OF MANHATTAN WOULD BE ENABLED TO COVER THE DISTANCE TO STATEN ISLAND VIA EXPRESS HIGHWAYS IN ⅓ OF THE TIME NOW CONSUMED
MULTIPLE HIGHWAY TO PHILADELPHIA AND ALL OTHER CITIES SOUTH AND WEST
MULTIPLE HIGHWAY TO ALBANY AND ALL CITIES NORTH EAST and WEST
BUS TERMINAL AND AEROPLANE LANDING FIELD
POST ROAD MULTIPLE HIGHWAY
BUS TERMINAL AND AEROPLANE LANDING FIELD
CAPACITY OF NEW HUDSON BRIDGE WOULD BE INCREASED SIX FOLD
IN A COMPARATIVELY SHORT TIME, MULTIPLE HIGHWAYS RUNNING OVER RAILROAD RIGHT OF WAYS WOULD REACH INTO BOSTON AND EVENTUALLY FORM A NETWORK OF WEATHER PROTECTED HIGHWAYS CONNECTING ALL THE CITIES OF THE EAST
THE NORTH AND SOUTH SHORES OF LONG ISLAND WILL BE BROUGHT HOURS CLOSER TO THE METROPOLIS, THE MULTIPLE EXPRESS HIGHWAYS AFFORDING HEADWAY NOW UNDREAMED OF ON THE BADLY CROWDED STATE AND TOWN ROADS.
ATLANTIC OCEAN
SOUTHAMPTON
STATE ROAD MULTIPLE HIGHWAY
LONG ISLAND
L. I. SOUND
NEW JERSEY
HUDSON RIVER
EAST RIVER
BROOKLYN
WITH THE HUDSON SPANNED WITH HIGHWAYS AT STRATEGIC POINTS MOTOR TRAFFIC WILL FLOW SMOOTHLY FROM ONE STATE TO ANOTHER
IF PROPOSED NEW TRI-BOROUGH BRIDGE WAS TO USE MULTIPLE HIGHWAY SYSTEM, THE SEGREGATION OF TRAFFIC WOULD RELIEVE THE GREAT CONGESTION THAT NATURALLY WILL FLOW OVER THIS TRAFFIC ARTERY
TRAFFIC CONTROL LIGHTS TO REGULATE TRAFFIC ON HIGHWAYS AND CITY STREETS.
TRAFFIC FROM CITY STREETS CAN ALSO REACH VARIOUS LEVELS OF THE HIGHWAYS VIA SLIGHTLY INCLINED LEADING FROM SPECIFIED STREETS.
PARKING SPACES
TRAFFIC SIGNAL LIGHTS
POLICE AND FIRE STATIONS
ROUTES BRILLIANTLY LIGHTED
PROMENADES
RAMPS WILL LEAD FROM ONE LEVEL TO ANOTHER
GASOLINE AND REST STATIONS
UPPER LEVEL—FOR HIGH SPEED AUTO TRAFFIC—WITH RAMPS LEADING TO LOWER LEVELS. ADEQUATE PARKING SPACES ON THIS AS ON ALL OTHER LEVELS
3RD LEVEL—FOR PASSENGER AUTOS AND CONTAINING PROMENADE, WALKS ON BOTH SIDES OF ROADWAY, REST ROOMS AND GASOLINE STATIONS AT CONVENIENT POINTS
4TH LEVEL—ONE WAY BUS TRAFFIC WITH DEFINITE PARKING STATIONS AND BUS TERMINALS. PROMENADE WALKS WILL BE EASILY REACHED BY MOVING STAIRWAYS
5TH LEVEL—ONE WAY BUS TRAFFIC WITH STATIONS AND PROMENADES AS ON FOURTH LEVEL
6TH LEVEL—THIS LEVEL REACHED BY RAMPS FROM STREET LEVEL TO BE USED EXCLUSIVELY FOR MOTOR TRUCKS
7TH or STREET LEVEL USED FOR LOCAL OR MIXED TRAFFIC AND WITH THE BULK OF THE CITY'S TRAFFIC REMOVED OVERHEAD TRUCKS WILL HAVE SPACE TO SPREAD IN LOAD AND UNLOAD—SOLVING THE MOST SERIOUS PROBLEM MANHATTAN MUST NOW CONTEND WITH
THE DR. JOHN A. HARRISS SYSTEM
AMERICAN MULTIPLE HIGHWAY
RUNNING THE LENGTH OF THE CITY—North and South
WEST SIDE—MIDTOWN—EAST SIDE
THESE HIGHWAYS WOULD BE CONNECTED WITH CROSSTOWN HIGHWAYS AT CONVENIENT POINTS, ALSO AT VARIOUS TERMINALS WITH MULTIPLE HIGHWAYS LEADING INTO BROOKLYN, LONG ISLAND and NEW JERSEY OVER PRESENT RAILROAD RIGHT OF WAYS, STATE ROADS, COUNTRY ROADS, ETC—AFFORDING SWIFT AND EASY ACCESS TO ALL POINTS. WESTCHESTER AND YONKERS WILL AUTOMATICALLY BECOME A PART OF THE METROPOLIS THEY BEING WITHIN 15 OR 20 MINUTES DRIVE TO THE CENTER OF MANHATTAN VIA MULTIPLE HIGHWAY
HIGHWAYS BRILLIANTLY LIGHTED THROUGHOUT THE CITY AND COUNTRY WILL MAKE FOR EASY DRIVING AT NIGHT AND RESULT IN A VERY SMALL PERCENTAGE AVOIDABLE ACCIDENTS DUE TO GLARING HEADLIGHTS and POORLY LIGHTED STREETS
MIDTOWN MULTIPLE HIGHWAY
MULTIPLE HIGHWAY
MULTIPLE HIGHWAY
EAST SIDE MULTIPLE HIGHWAY
OUTLINE MAP OF MANHATTAN SHOWING THE HEART OF HIGHWAY SYSTEM WHICH CONNECTED WITH OUTLYING LINES WILL SOLVE FOR THE NEXT 100 YEARS MANHATTAN'S TRAFFIC PROBLEM. EAST and WEST ARTERIES ARE TENTATIVE and INDICATE ONLY POSSIBLE CONNECTIONS WITH NORTH and SOUTH EXPRESS HIGHWAYS.
A NEW CITY WILL BE CREATED WITHIN THE PRESENT CITY—LIGHT MANUFACTURING CENTRES WITH SHOPS ETC WILL COME INTO BEING ALONG THIS MULTIPLE HIGHWAY—ACCESSIBLE WALKS FROM ROADWAY TO RESPECTIVE FLOORS OF BUILDINGS WILL RELIEVE THE SURFACE ROADS OF ALL PEDESTRIAN TRAFFIC—THE UPPER FLOORS OF BUILDINGS WILL FURNISH A NEW HOUSING CENTRE WITH LIGHT and SUNSHINE.
PIPE LINES ATTACHED IN OBSCURE PLACES ON HIGHWAYS WILL PROVIDE AN ECONOMICAL METHOD OF SUPPLYING GASOLINE, OIL, ILLUMINATING GAS, FUEL OIL and WATER.
TELEGRAPH and TELEPHONE WIRE CONDUITS—ALSO PNEUMATIC MAIL CHUTES CAN BE EASILY INSTALLED.
GRADE CROSSINGS WITH THEIR PRESENT POSSIBILITY OF FATAL ACCIDENTS WILL BE ELIMINATED AS THE MULTIPLE HIGHWAYS WILL BE SO CONSTRUCTED AS TO CLEAR ANY and ALL RAILROAD CROSSINGS.
NEW MULTIPLE HIGHWAY WILL FORTHWITH SUGGEST NEW THEATRE DISTRICTS
SIDEWALK
STREET
WEST SIDE MULTIPLE HIGHWAY
SIDEWALK
MULTIPLE HIGHWAYS WILL DO AWAY WITH "RIGHT OF WAY" DISPUTES, THE CHIEF CAUSE OF MANY ACCIDENTS, AND TRAFFIC TROUBLES

may be constructed or erected along the right-of-way of existing railroad lines, thereby overcoming the necessity of constructing new roads, while affording a protection for the railroad lines along which it passes."

Dr. Harriss does not give an estimate of cost, stating that this can be readily ascertained by the engineering departments of state and city governments and other authorities interested, and saying, "I believe that the expense of erecting this highway as compared with the expense of building state highways. . . . would be more or less compensated for by the reduction in the cost of maintenance as compared with the cost of maintenance of state highways at present."

Land Exploitation as a Hindrance to Rational City Planning and Zoning

Excerpts from Report of Committee on Community Planning of the American Institute of Architects, May, 1927

IN city planning as at present practiced, zoning regulates in a very detailed way the private use of land; it qualifies the type of occupancy, the area covered, and the height and bulk of buildings permitted upon it; in certain cases it goes so far as to say that not only must the kind of use be regulated, but even the number of families to be accommodated upon a given plot. Here is a very definite interference with the free use of his property by each and every owner. Most of these provisions are accepted as reasonable and just, and, through a broad interpretation of the police power, have been upheld vigorously by the Supreme Court.

The benefits of zoning are considerably curtailed, however, wherever premature land exploitation has added a complicated basis of property lines and irrelevant subdivisions; and regulations which tend to prevent bad practices in building are often equally effective in handicapping the architect and in preventing better practices. To be of use to the architect, zoning must not merely regulate the land as an end-product; it must regulate land at its source end, so as to give the user of the land a sound basis for its subsequent development. Failing such original restrictions, our cities open up land, establish building lines, project highways and subways in a fashion that, on any cold calculation, must lead either to bankruptcy or to completely inadequate service. The relative lack of playgrounds, schools and parks in the newer areas of our growing cities is the alternative to bankruptcy. The alternative is not a happy one. Many of our municipal authorities who are aware of the rising bonded indebtedness and the decreasing standard of completeness in public improvements are gravely concerned over the situation; and they have every reason to be concerned. . . .

If our municipalities cannot under their constitutions actually forbid land subdivisions without their consent, they might prescribe the most severe, standardized regulations in street widths, in lot sizes and shapes, in building lines, etc., for those who exploit land for indiscriminate use. On the other hand, they should accord to those actually prepared to build for a specific purpose, the fullest encouragement to rearrange, widen or narrow streets, within certain broad boundaries, and to vary from stringent and stultifying regulations which hinder intelligent planning.

Our bad practices in land exploitation have given reason for the stringent regulations that at present exist. The foregoing suggestions would keep these regulations in force where necessary, as a guarantee against slipping back from the standards already established, but it would go a step further and reward sound methods. What this reward means to the architect, we have plenty of precedents to assure us. Anyone who has recently visited England and continental countries cannot fail to have been impressed with the general and almost universal improvement in the planning of dwellings. This has been due to the fact that under governmental subsidized building, architects and builders have been relieved of cramping site regulations, such as side line restrictions, or fixed street widths, lot widths, and depths, and have been permitted to design for use and for actual building efficiency. Given this opportunity for the architect and the community planner to function, buildings become broader and shallower, brighter and more efficient, and in most cases actually less expensive in total cost, including genuine land and utility costs, than the miserable barracks which mark the most recent developments in our moderate-priced communities, in Boston, Brooklyn, Philadelphia, Baltimore, St. Louis, Chicago.

We do not have to go abroad for this demonstration. The inherent value of planning to fit use, rather than to fit lot-shapes, was exhaustively proved in the work of the War Housing Boards. Unfortunately, the almost universally expected advance in the field of industrial housing in the early post-war period, received a grave setback by the great land boom that followed—with its attendant and generally misapplied Own Your Own Home movement. There have, however, been recent evidences of a revival of effort in group housing and community development which promise more than their present limited extent would indicate.

EDITORIAL NOTE.—A resolution proposed by the Committee on Community Planning and adopted by the Convention, is published on page 800. The members of the committee are: Henry Wright, Chairman, F. L. Ackerman, Frederick Bigger, John Irwin Bright, W. H. Cassebeer, M. H. Goldstein, Wm. T. Johnson, Charles H. Cheney, Elmer C. Jensen, Wm. Schuchardt, Rudolph Weaver, H. D. Walker, Clarence S. Stein.

An important joint resolution on Subdivision Control, adopted by the National Conference on City Planning and the National Association of Real Estate Boards, will be published in THE AMERICAN CITY *next month.*

The Menace of Fire and Panic in Theatres

A Plea for the Safeguarding of Places of Public Assembly Before and Not After Tragedies Occur—New Provisions for Building Exits Codes

By Robert S. Moulton

Assistant Secretary, National Fire Protection Association; Secretary, Building Exits Code Committee of the American Engineering Standards Committee

THE year 1927 was only nine days old when it was added to the list of those against which stand the black marks of the biggest theatre catastrophes in the fire record of the twentieth century. With bitter irony, "Get 'Em Young" was the title of the picture shown at the Laurier Palace Theatre in Montreal on the afternoon of Sunday, January 9, before a capacity audience. When fire came, seventy-eight persons perished, and only one was more than sixteen years of age.

It is a sad commentary on public intelligence that *after*, and not before, such tragedies, communities are aroused to the fire menace which must always be considered to exist in all places of public assembly; and an even sadder commentary that these periods of public arousal are pathetically brief. The record of history shows only too plainly that the interval between one holocaust and the next may almost be measured in months, even when the conditions that led to the most recent tragedy are well known and given the widest publicity. The lesson of today is forgotten tomorrow.

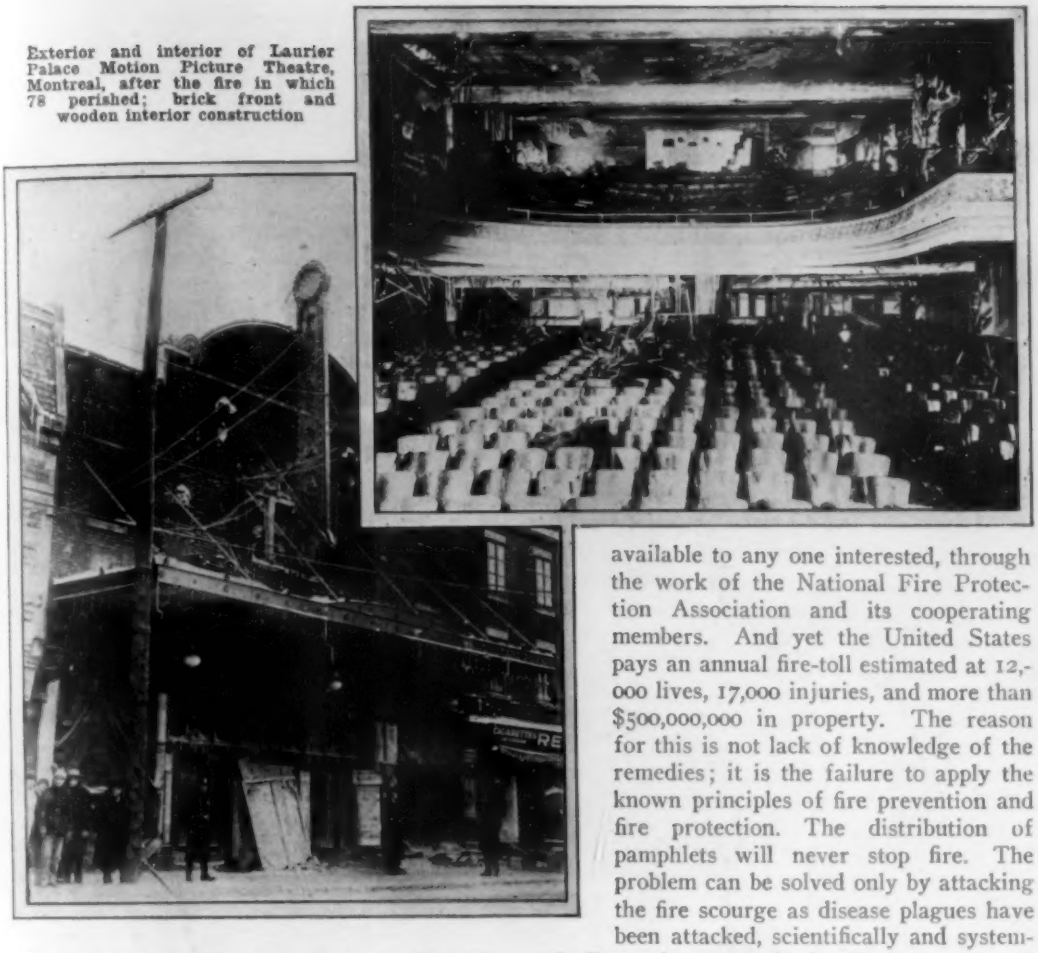
Any one might have recognized the glaring fire hazards of the Laurier Palace Theatre. As a matter of fact, the proprietor had been cited a number of times by the Fire Prevention Bureau of the Montreal Fire Department for failure to observe various provisions of the fire laws. But in spite of these infractions the place was not closed by the authorities. Only the outside walls were of non-combustible material. The fire, starting in a concealed space under the balcony floor, probably by a smoker, since testimony indicated smoking was common in the place, spread quickly.

The loss of life occurred in a stairway leading from the balcony to the lobby. In its construction and arrangement it was a veritable death-trap. Steep, without hand-rails, narrowing at the first landing, narrowing still more at the second landing where persons going down had to make a right-angle turn, obstructed by swinging doors at the lower landing, more than half-blocked at the bottom by a door swung across it as the crowd surged from the main floor, this stairway was left unburned as positive evidence of the violation of the recognized rules of exit construction. So tightly wedged were the bodies of the dead, that a dozen men, pulling on a rope tied around one body, could not break the jam, and firemen had to cut a hole from the underside of the stairs in order to extricate the dead and dying children.

Flagrant Violations of Safe Practice

In commenting on this tragic case, the National Fire Protection Association cited seven other flagrant violations of safe practice in addition to the stairway: (1) Wooden interior construction, wooden lath and plaster finish, no automatic sprinklers. (2) The only exits from the balcony led into the lobby; there were none leading directly outdoors. (3) Either there was no system of emergency lighting or it failed to function when needed. (4) No effective measures were taken to prevent smoking. (5) People were permitted to stand in the aisles. (6) Young children were admitted unaccompanied by older persons. (7) While one usher did good work, no employee was on hand at the fatal stairway.

The conditions which caused the Montreal catastrophe can be found in greater or less degree in hundreds of motion picture theatres and other places of public assembly throughout the United States and Canada. Unless public officials realize their responsibilities, repetitions of that sacrifice may occur at any time. From the viewpoint of the panic hazard, the most feared causes of theatre fires are those which make for the rapid spread of flame and smoke in the auditorium. The stage filled with combustible scenery, and the motion-picture projection booth with its flammable films, are the most vulnerable points in the average theatre. The Iroquois Theatre fire, which caused the loss of 602 lives in Chicago in 1903, started on the stage, and a number of serious fires have started in motion-picture film. In point of money loss to theatre property, statistics show that the most important fire cause is heating apparatus (stoves, furnaces, boilers and their



Exterior and interior of Laurier Palace Motion Picture Theatre, Montreal, after the fire in which 78 perished; brick front and wooden interior construction

pipes), with electricity a close second. The electrical hazard is important owing to the "effects" used in many productions and to the likelihood of overloading circuits by the use of extra lights and apparatus. Matches and smoking held third place, followed by defective chimney flues, rubbish and litter, and gas, natural and artificial.

The Fire Scourge Must Be Attacked Scientifically and Systematically

In spite of the fact, all things considered, that more attention is probably paid to the fire hazards of theatres than of any other occupancy, theatres continue to burn. The records of the National Board of Fire Underwriters show that more than two theatres burn every day in the year on an average. This is a striking illustration of the difficult nature of the whole problem of fire prevention. Every competent fire protection engineer knows that the majority of fires are preventable and the remaining small fraction are controllable. The technical information on fire prevention and fire control is available to any one interested, through the work of the National Fire Protection Association and its cooperating members. And yet the United States pays an annual fire-toll estimated at 12,000 lives, 17,000 injuries, and more than $500,000,000 in property. The reason for this is not lack of knowledge of the remedies; it is the failure to apply the known principles of fire prevention and fire protection. The distribution of pamphlets will never stop fire. The problem can be solved only by attacking the fire scourge as disease plagues have been attacked, scientifically and systematically, under expert leadership.*

The proper application of scientific knowledge, now available to all, would altogether prevent the vast majority of theatre fires, but it is a well-known fact that the fire hazard when applied to places of public assembly includes also the fearful menace of panic. The fire which

* That such an attack has actually been undertaken is a matter of great public interest. With Irving T. Bush, President of the Bush Terminal Company, New York, as Chairman, as mentioned in THE AMERICAN CITY last month, a committee of representative business leaders from many parts of the United States is raising a fund of $500,000 in a nation-wide campaign. This fund will finance the operation for the next five years of ten skilled fire protection engineers wherever they are needed. Supervised by the National Fire Protection Association, which has been building the foundation for such work by its technical and educational activities for the past thirty-one years, these men will work through local fire prevention agencies and civic organizations. The practicability of the plans and the value of such an attack have been amply demonstrated by the experience of the past three years, during which two field engineers of the National Fire Protection Association have visted more than eighty cities, doing most effective work in stimulating local fire prevention efforts. Statistics can give no accurate measure of the extent of the fires which might have occurred had it not been for fire prevention, but the city fire loss records show a signal and in some cases a spectacular improvement as a result of this work. And even a single million-dollar fire prevented, or one theatre holocaust avoided, amply justifies an effort far beyond that thus far devoted to this activity.

may amount to nothing is likely to start a panic which will take many lives. A case is on record where an inexplicable wave of terror swept through a large public meeting in an open square, and in the rush that followed, a number of persons were trampled to death. The danger is multiplied a hundredfold when people are surrounded by four walls. For years the Fire Department of New York City has been endeavoring to educate the public to exit calmly in case of fire, apparently with some success, for in several recent instances theatre crowds have walked out quietly on the alarm of fire, and thus avoided loss of life.

Making Places of Public Assembly Panic-proof

The question of making places of public assembly as nearly as possible "panic-proof," as well as "fireproof," is the main subject of the 1927 report of the Committee on Safety to Life of the National Fire Protection Association* presented at the annual meeting of the Association in May. It includes a new section on Places of Public Assembly to be added to the Building Exits Code of the National Fire Protection Association, which has recently been officially approved by the American Engineering Standards Committee. This report is of particularly timely interest in view of the Laurier Palace Theatre disaster, and represents the latest expert thought along the line of life safety in places of public assembly.

In addition to complete specifications for the number and arrangement of exits, two matters which the code covers in detail are the location of such places and their capacity. The first item includes not only a building's immediate surroundings but its height above or depth below grade level. The code specifies that "buildings and rooms for public assembly shall have ample and unrestricted access to public ways of approach on one or more sides, at least one of which ways shall be a public road or street. Assembly halls, theatres and places of recreation and amusement having a capacity of 1,000 or more persons shall have access to two ways, and if of a capacity of 2,000 or more persons both of such ways shall be public ways or open yards to public ways." The importance of making certain that exits will not be blocked by those already outside the building is here recognized.

On the question of capacity the code says: "Places of public assembly in buildings of frame construction or ordinary construction shall have limits of capacity not in excess of 2,000 persons and those in buildings of fire-resistive construction shall have limits of capacity of 5,000 persons except that these limits may be increased under special regulations of the enforcing authorities." Further study is to be given to places of public assembly having a capacity greater than 5,000.

The hazard of elevation is clearly recognized under the head of capacity: "A place of public assembly more than 42 feet above grade shall be permitted only in a fire-resistive building, and its capacity shall not exceed 1,000 persons." At 21 feet the capacity is 3,000, and in buildings of ordinary construction, 400. The table carries the scale down to 15 feet below grade, when the capacity is limited to 200 for buildings of fire-resistive construction and prohibited for all others. This matter of elevation enters also into the number of exits considered adequate, the other factors in the formula given in the code being building, construction, protection of vertical openings, automatic sprinkler protection, horizontal exits and capacity. As an illustration of the application of the rules, a typical example is given. A balcony in a fire-resistive theatre building has a capacity of 370 persons and the principal entrance doors of the balcony are at an elevation of 30 feet above grade. There are no "horizontal exits" nor is the building equipped with automatic sprinklers. The required number of units of exit width (22 inches each) is determined by the formula as fourteen, each unit being 22 inches, the space allowed for one file of people passing through a doorway. Two 66-inch exits and two 88-inch exits will meet the requirements.

Other Details of the New Code

The code covers carefully exit details, such as doors, aisles, and stairways. The seating arrangements are an important consideration. The familar sight in many motion-picture theatres of a crowd waiting in the lobby until seats within are available, is treated as a fire hazard. In the Rialto theatre fire in New Haven a few years ago, the people rushing out to escape cremation were met by those waiting for the "second show," who pushed forward to gain admittance, not realizing there was a fire. The crowd outside soon discovered the mistake, but four people were burned to death in the theatre and a number seriously injured. The code specifies that waiting should be restricted to areas separated from the required exit-ways, and exits for such waiting-spaces provided in addition to those for the main auditorium. Every place of public assembly for 500 or more persons should be equipped with a fire-alarm system, and employees should be drilled in the

* Obtainable on request from the National Fire Protection Association, 40 Central Street, Boston, Mass.

duties they are to perform in emergency.

Another provision in the code is that every theatre using movable scenery or decorations shall have a fire-resisting curtain capable of withstanding lateral pressures of 10 pounds per square foot and shall have an emergency device capable of causing the curtain to close without the use of applied power. When so closed, the curtain shall be reasonably tight against the passage of smoke. This is to safeguard the audience against fires originating on the stage, and to perform effectively the function for which the familiar "asbestos curtain" was designed but for which it has been in the majority of cases totally inadequate, because of its flimsy construction.

It is important that projection booths where motion pictures are shown should conform to the best protective standards. They should not only be fire-resistive, but should be built so that smoke and fumes, in case films ignite within, will not spread outside.

Theatre fires are no exception to the general rule: Fires are preventable. The continual burning of theatres, and other places of public assembly, with the grave danger of panic and loss of life, is a disgrace to the country. The great tragedy is that progress in safeguarding human life in such places so often comes only after a disaster like that in Montreal last January. Is there any thinking man who will deny that the price is too high? The scientific knowledge to check the fire scourge is in hand. The question before every citizen, particularly those in positions of authority, is: When shall that knowledge be applied?

Fire Prevention Methods of Prize-Winning Cities in Inter-Chamber Fire Waste Contest

THE prize-winning awards in the 1926 Inter-Chamber Fire Waste Contest were made on May 22, 1927, by Governor Walker of Georgia before the National Councillor Meeting, at the annual meeting of the Chamber of Commerce of the United States in Washington, D. C.*

Inasmuch as the Chamber of Commerce of Albany, Ga., for the second year in succession won the award for all cities regardless of population, Governor Walker was called upon for the second time to make the presentations. In doing so he called attention to the rigid inspection program followed in Albany, where a patrol covers the entire mercantile section once an hour every night and goes through every cotton warehouse three times a night. This little city of 13,451 population (1920 census) also carries on salvage operations to prevent water damage, which were completely successful last year.

In Milwaukee, Wis., the winner among cities of over 100,000 population, inspection also plays a large part, 423,000 inspections of buildings having been made during the year in this city of over 500,000 people. Special inspectors were also detailed to all large stores during the Christmas rush; 415,000 persons witnessed fire-alarm demonstrations during the year. Educational activity was stressed, and the Association of Commerce conducted an annual Fire Prevention School for the benefit of the employees of local industries, while in addition one session of the annual Foreman Safety School was given over to fire prevention. Several thousand persons attended these schools regularly.

Thoroughgoing inspection was also a large factor in the case of Owensboro, Ky., whose Chamber of Commerce was the winner in the class of cities having between 20,000 and 50,000 population. The city was divided into eight districts, with a member of the Chamber's Fire Prevention Committee as chairman for each; inspection crews were organized and every building, residential and otherwise, was visited. It required three weeks for the city to remove all of the rubbish and other combustible material that was collected as a result. Regular inspection work was also carried on, the residential district being inspected four times during the year and the business district twelve times. Special attention was paid to fire prevention during holiday seasons.

Not merely a committee, but a large Fire Prevention Bureau, was organized under the sponsorship of the Chamber of Commerce in Huntington, W. Va., winner among cities of between 50,000 and 100,000. This Bureau secured six new pieces of fire-fighting apparatus and has recommended to the City Commission that a new central office be erected and an entirely new fire-alarm system be installed, and is seeking the establishment of a salvage corps in the fire department. Rigid fire-prevention legislation that it has advocated has been enacted.

*The prize-winning cities, a list of which had been previously announced, together with the cities receiving honorable mention, were given on page 530 in the April issue of THE AMERICAN CITY.

Standardization of Fire-Hose Couplings

Up to February 1, 1927, 2,238 cities and towns in the United States have had their fire-hose couplings and hydrants converted to the National Standard Thread. The work of converting non-standard fittings has been actively pushed since 1920, when only one in eight protected communities had standard threads. A pamphlet giving a record of existing threads on fire-hose couplings and fittings in cities of 20,000 population and over has been compiled by the National Board of Fire Underwriters, 85 John Street, New York.

What a Village Art Commission Might Do

By Martha Candler

A VILLAGE in the metropolitan area of New York City has been headlined by the press and has otherwise received unwelcome publicity for the manner in which, recently, its newly organized art commission suddenly dissolved. The president of the village, according to news accounts, appointed the commission, composed exclusively of women, to promote beautification schemes. One of its first acts was the erection of signs at main approaches to the village. These signs bore the legend: "You are now entering Beautiful ———." At least one of them was promptly removed by the park commission of broader than village scope into whose plan the sign obtruded. It was further along in its activities, however, that the art commission, officially visiting the butcher (among other business men), made specific recommendations for the removal of his liver and kindred commodities from their display place in the window of his shop. This led to organized protest from the merchants to village trustees; and the commission's complete dissolution followed speedily. Except for a rift in the peace and harmony of the little village, things were back where they started from.

Should they remain there and the praiseworthy impulse of the village president be lost because of a false start, the name of civic beauty may stand compromised for years to come before the business men of that village, and the whole cause of community art commissions will be damaged. But if the village will resummon the courage of its first conviction, and, in addition, will take a leaf from the experience book of other communities, it may turn defeat into victory and achieve some distinctive results.

Proper Functions of a Municipal Art Commission

What is a municipal art commission? One thing, outstandingly, it is *not,* namely, a body authorized to interfere with private citizens in the legitimate conduct of their daily affairs. As ordinarily organized, it is made up of men and women whose superior training and experience qualify them to pass upon the artistic value of public projects, or the projects of corporations or individuals whose structures encroach on public lands. It comprises usually at least one architect, one sculptor, and other artists, as well as several prominent lay persons chosen by the head of the local government from lists submitted to him in various ways. Working independently, or supplementing and reinforcing the local planning and zoning boards on the esthetic side, the art commission represents official recognition by a civilized public that beauty has place alongside utility in the development of the community.

It usually functions in a critical and advisory capacity, but sometimes is given veto powers and legal jurisdiction to delay indefinitely or permanently prevent the erection of public work it considers ill-conceived artistically. It ordinarily passes upon war memorials, statues, and the design of bridges, fire and police stations and other municipal buildings, as well as lamp-posts and such street and park "furniture." In a village where it is apt to be the one organization working actively in this field, there is no reason why it should not go beyond the purely critical and advisory activities and adopt, perhaps through special committees, programs for the aggressive promotion of whatever contributes to the beauty and art of the locality. In the working-out of such programs, women—these women whom the village president under discussion asked to go about an "essentially feminine beautification mission"—have their contribution to make. Working in close coordination with the other interests of the municipality, they will realize, as business realizes, that displays in shop windows are merely incidental. What matters is whether the butcher shop is in the heart of a residential section, or incorporated into an appropriate community center in a block of attractively designed business buildings, or in a building of its own that fits into the general scheme.

Billboards and Hot Dog Kennels

Billboards bloom overnight on private property facing railroad tracks or highways of a town, even of the village suburban to New York City set in one of the most perfectly landscaped stretches of parkway in America. It might be the business of an art committee to report these to the proper authorities through the commission proper; and with them, the lunch carts, gas stations, and hot dog and peanut stands that sometimes creep into undesirable places. Action through the proper channels may result in better ordinances for the control of such institutions. Streets lose their fine old shade trees from gas, smoke,

and insect pests, and these are often not replaced or even the spread of damage stopped through tree surgery, where there is no local art body of the informal sort. Public carelessness causes seasons of blown litter in streets and parkways; and public trash receptacles vanish without being replaced by newer and more attractive ones. Where these and other blots on the town beautiful cannot be cured by legal compulsion, an aroused public opinion may accomplish great things through voluntary action.

In one New England village, a committee of women achieved the landscaping of the railroad yards and track margins near the station when the railroad found it inconvenient to do so. They subsequently curbed up the numerous triangles caused by irregular street intersections, and in the planting of these triangles carried through a scheme that gave an air of ordered beauty to the town. Well-designed historical markers of wrought iron commemorating Revolutionary events were placed at historic sites. This committee spend thousands of dollars. They make it themselves. But a significant thing is that throughout their village there is a friendly rivalry in helping to put through whatever the women undertake. One small town, suburban to New York City, is noted for its artist population. A woman's art committee there has provided a community studio, which stands on public land behind the town hall, and which affords a center for exhibitions and for art instruction for children, and older people, of the community. A woman's art committee in one township promoted the public and private planting of pink dogwood, to the end that the whole countryside comes to enjoy its beauty in blossom time.

Inspiration is not lacking for the small-town art group who get together in the name of beauty. If every village and small town in America would make the best of such talent as it has to this end, the face of the country would speedily be changed. This particular village of which we are speaking, set in the midst of one of the most distinctive suburban areas in the world today, might well assist in the making of regional-plan history. There is opportunity for close cooperation with its village plan board, which in turn coordinates its efforts with those of a county planning federation—the most highly organized one in the country; with an equally distinctive parkway commission, and with the Regional Plan of New York and Its Environs, and which has the privilege of drawing upon the newly organized Art Council of the City of New York for information and aid. And this is to say nothing of the cooperation and friendly interest available, as a matter of course, from the old and well-established Municipal Art Commission which is a part of the municipal machinery of New York City.

Privately or Publicly Owned Bridges?

SHARPLY conflicting views as to public policy regarding important bridges were expressed recently by Governor Smith of New York, in a message to the Legislature, and by the New York *Sun*, editorially. In vetoing a bill to create the Thousand Island International Bridge Corporation, authorized to build a span across the St. Lawrence River near Collins Island, the Governor said:

"I think the time is past when the state should incorporate companies of this kind. Such bridges should be built from public funds or through an agency such as the Port of New York Authority, authorized to issue bonds at a low rate of interest and limited in tolls to the amount necessary to retire and pay interest on the bonds. Experience with private bridges is that they result in large profits to stockholders and other private parties and the maintenance of high tolls. Bear Mountain Bridge at Peekskill is a good example. The maximum tolls were fixed in the act. Interest on preferred stock was limited to 8 per cent, but the company was permitted to issue share for share of common stock. The bridge was to revert to the state at the end of thirty years and there were provisions for recapture at a greatly lowered price in the course of thirty years. It is apparent the bridge not only will pay the 8 per cent on the basis of tolls less than the maximum permitted to be charged, but will pay a large return on the stock, and that it would be a good business proposition, if the state had the money, to take advantage of the recapture clause.

"Private bridges of this kind bring with them approach and traffic problems which in the end fall upon the state and the municipalities, and what looks at first like a purely private business proposition becomes a public problem of traffic and planning affecting all the surrounding territory. Obviously, these related problems which go with such a structure can only be properly solved by a public authority.

"I have just signed a measure setting up a public non-profit-making bi-state authority similar to the port authorities of New York and Albany, to build the Champlain bridge, and also a measure providing for a study of a Niagara Port and Frontier Authority, which, if it is established, will have the power to plan just such bridges as this without private profit and solely in the public interest. I think this project and similar bridges, such as the Grand Island bridges, can wait until a public authority is established for the purpose."

The Sun, in keeping with its tradition, uses

the Bear Mountain Bridge as an excellent example of private initiative, claiming that it was undertaken much sooner than if it had been left to public enterprise, and was constructed in half the time required for a state project.

"Many of these investors kissed their money good-bye at the outset. If they had lost it, they would now have no redress. It happened that their investment was good. The motorists, free from the discomfort of the wretched ferries, blessed them. Now, it seems, their bridge is an example of what should not be. . . . The Governor regrets that the state has not the money to recapture the Bear Mountain Bridge, so that it could make a 'profit which ought to go to the public either in the form of reduced rates or in the form of returns which could be used for other improvements.' Catch the state getting any 'return'! If the state should recapture the bridge, the first demagogue running for governor thereafter would pledge himself for free bridges—and probbably he would be elected. Free bridges would mean so much joy-riding that new parallel spans would have to be built to accommodate the overflow. . . . For the state to plunge into what is naturally the field of private business, when private business is willing to take the risks as well as the possible profits, would be inherently unwise."

Irrespective of theories or prejudices for or against public ownership, many cities—and states—are faced with a situation where funds are not available for large bridge-building projects, and where debt limits prevent further borrowing. In such cases resort will doubtless be had either to the scheme of private construction and operation for profit with reversion to the state or municipality after a period for amortization, or to the public authority plan whereby funds are obtained on the security of the specific enterprise rather than under the taxing power.

A resolution on the subject of highway bridges, adopted by the Chamber of Commerce of the United States at its annual convention, May 5, 1927, runs as follows:

"The construction of important bridges causes financial problems in connection with improvement of highways. Whenever after careful survey it is found to be necessary to meet these problems by permitting the erection of toll-bridges, authority to build and operate such bridges should be granted only upon definite conditions. These conditions should include a requirement that construction and operation will be under the control of appropriate public agencies with a duty to see that the public interest is in all ways safeguarded and a provision that the right to collect tolls shall cease after there has been opportunity to obtain a reasonable return."

A Plan for a Public Milk Monopoly

AFTER pointing out that the retail price of milk in New York City is two to three times the amount paid to the farmer, and stating that the price of milk, from the standpoint of adequate child nourishment, in the community at large, is of even greater importance than bacteriological or chemical content, William Jourdan Rapp, writing in *The Nation*, presents a plan "for the reorganization of New York's milk industry, by which the city may achieve an adequate and cheap as well as a safe supply of milk. As the milk problem facing most of the large cities of the country is similar to that facing New York, although naturally not so immense or complicated, this plan may offer suggestions for other communities." To quote in part:

"It is interesting to note that during the last few years there has been a rapid consolidation of milk and ice-cream companies in various parts of the country. The tendency toward monopoly is pronounced, but it is a monopoly whose economies result in added profits for the promoters and not in cheaper milk for the consumer. . . .

"A private monopoly, privately operated under government control, and a government monopoly with government operation are the systems most often suggested as solutions for New York City's milk-supply problem. American cities have had experience with both in connection with gas, electricity, water, and transportation. Adapted to a milk supply, they would present added difficulties, although either one would be a vast improvement over the system at present in operation. But there is another plan which combines most of the merits of those mentioned and eliminates many of their weaknesses. This plan provides that the city shall purchase the entire milk-distributing machinery through an issue of city bonds and the formation of a milk corporation to operate the city-owned monopoly. Legislation can be passed compelling the present milk companies to sell their properties at a price fixed by the courts.

"The board of directors of the new monopolistic corporation will consist of seven members, one representing the workers in the industry other than executives and technical experts, one representing the farmer selling milk to the corporation, one representing the executives and technical experts, and four representing the public, two appointed by the mayor of the city and two by the governor of the state from lists submitted by the three members representing workers, executives and farmers.

"This board will be responsible for the policies of the corporation. It will select a president who will be the chief executive in charge of all operations and responsible only to the board. The board will set the rate of wages and the price of milk to the farmers. The price of milk to the consumers, when the milk corporation takes over the industry, will be the average of the preceding year. Twenty per cent of the surplus, after operating

expenses and interest and amortization on the bonded indebtedness are paid, will be divided among the workers, executives, and technical experts, each sharing according to their yearly salary; and 20 per cent among the farmers, each sharing in proportion to the amount of milk he has sold the corporation. The other 60 per cent of the surplus will go toward reducing the price of milk. If a sudden depreciation in the value of money should necessitate a rise in the price of milk to prevent the corporation from operating at a loss, the board of directors will have the power to order the necessary increase.

"Such a plan will help the position of the farmers by giving them a voice in the management of the corporation to which they sell their milk. The board of directors will be in a favorable position to undertake an impartial study of the cost of milk production, thus enabling it to set a fair price to the farmers. All the figures available at the present time on this subject are either prejudiced for or against the farmer to such an extent as to make them worthless. By paying the farmers enough to make dairying profitable and allowing them to share in the surplus the city will be assured an adequate milk supply. . . .

"To the people of the city the plan guarantees a milk supply operated for public service. Adulterated and bootleg milk result from the desire for profits on the part of the dealers. The Health Department can easily control the milk supply coming into the city through the milk corporation. The public will have a majority of representatives on the board of directors."

Obstacles to the Development of a Recreation System

By Frederick Bigger

Architect and Town Planner, Citizens Committee on City Plan, Pittsburgh, Pa.

THOSE who are interested in seeing what happens to city plans after they have been made are probably conversant with many of the difficulties that must be overcome before the actual execution of a city plan may be considered to be under way. During the past six years there have been opportunities to observe how the physical system of public recreation sites of the city of Pittsburgh has been affected by the work of the Citizens Committee on City Plan. Readers of THE AMERICAN CITY may recall that this unofficial body of citizens, expending only privately subscribed funds, has issued six principal reports which comprise the Pittsburgh Plan. The first of these reports (1920) consisted of plans for the city-wide distribution of athletic field centers and of playgrounds*, and the fourth report treated the distribution of parks in the same broad manner. It is the object of this brief article to cite some of the obstacles met with in one large city with respect to the provision of recreation sites suitable in size and physical character for the types of public recreation activity which are commonly recognized as essential. The statement will be confined to athletic field centers and playgrounds.

Real Estate Costs Not Chief Obstacle

Contrary to what might be a prevailing impression, it is the writer's opinion that the cost of real estate does not represent the most serious obstacle to the development of an adequate physical plant for this actual municipal public utility service called by the rather indefinite term, public recreation. The difficulties encountered in Pittsburgh, and doubtless those that are met with in other cities, have their roots in cerain basic factors; namely, ignorance, coupled with aversion to fact; political accommodation; public desire to "get something while the getting is good"; and short-sighted alleged "practicality." These factors all mesh with each other to retard the application of any entirely reasonable procedure.

Ignorance and Aversion to Fact

Those who profit through mutual accommodation may be ignorant of important facts or they may prefer to ignore these facts. Whatever the cause, there is a failure to differentiate the several standard types of activity which are commonly recognized in the public recreation activities of American cities. These activities call for parks (not discussed here), athletic fields, and playgrounds. And the latter should be subdivided into senior boys' playground, senior girls' playground, and playgrounds for junior children. The typical plans accompanying this article show (a) that in size and arrangement there is the greatest difference between the athletic field center and the playground, and that a three-unit playground is a more efficient operating unit than three separated units would be; and (b) that wherever rough topography is a basic condition, as in

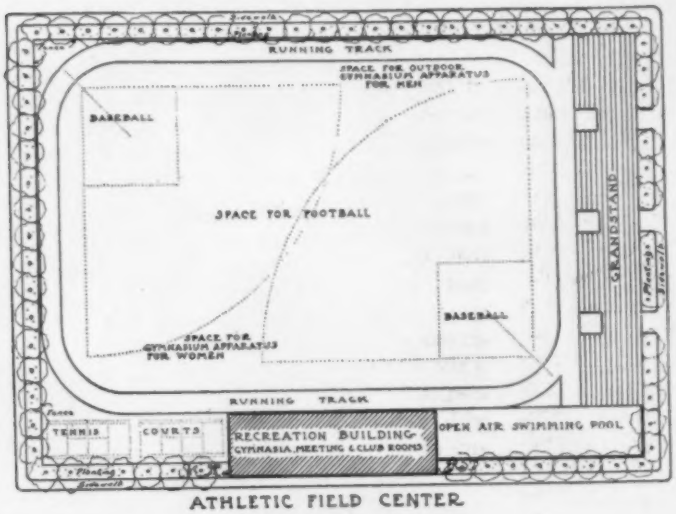
* When the report was issued, the findings of the Committee indicated that 50,000 children, between the ages of 6 and 16 years, lived farther than a 15-minute walk from an existing playground, whether that playground were a completed one or only an undeveloped site.

Pittsburgh, it becomes vitally important to determine both the extent of usable land which may be obtained in any given site and the ultimate and complete cost of remodeling a raw piece of land into a usable site. In the absence of facts of this kind which should be known, it is the normal thing to appease local demands by purchases of ground which may or may not be specified for a particular purpose and which may not be developed into adequate administrative units. Either ignorance of or aversion to these facts will probably and with reason be laid at the door of many public officials and perhaps be credited to the majority of the citizens. However, the otherwise competent technical man (chiefly the municipal engineer) cannot plead ignorance and should not admit aversion to the facts. Technical competence probably succumbs to the atmosphere of opportunist compromise which envelops most public work, and faces are saved by specious arguments of practicality.

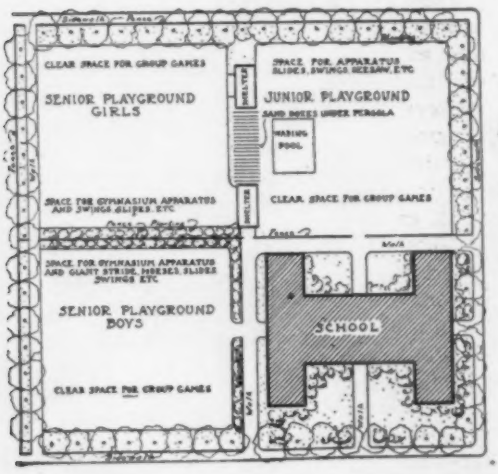
Political Accommodation

This factor is synonymous with opportunist compromise. When or if one is not hampered by the facts, the scope of opportunist compromise is indefinitely extended, more constituents can be immediately pleased, return to office is made more probable; and the future need not disturb the mind of one adept in the great American game. Neither in Pittsburgh nor elsewhere need an impartial judge lay too much blame upon elected officials, inasmuch as they constitute in effect a board of directors which is compelled, or believes itself to be compelled, by the stockholders (citizens) to respond to advice and suggestions based upon partial knowledge, complete ignorance, or selfish motives.

POSSIBLE ARRANGEMENT OF DIFFERENT TYPES OF RECREATION SITES ON MINIMUM-SIZE PLOTS



ATHLETIC FIELD CENTER


CLEAR SPACE FOR GROUP GAMES
SENIOR PLAYGROUND GIRLS
SHELTER
SPACE FOR APPARATUS SLIDES, SWINGS SEESAW, ETC
JUNIOR PLAYGROUND
SAND BOXES UNDER PERGOLA
WADING POOL
SHELTER
SPACE FOR GYMNASIUM APPARATUS AND SWINGS SLIDES, ETC
CLEAR SPACE FOR GROUP GAMES
SPACE FOR GYMNASIUM APPARATUS AND GIANT STRIDE, HORSES, SLIDES SWINGS ETC
SENIOR PLAYGROUND BOYS
SCHOOL
CLEAR SPACE FOR GROUP GAMES

POSSIBLE ARRANGEMENT OF DIFFERENT TYPES OF RECREATION SITES ON MINIMUM SIZE PLOTS OF GROUND

SCALE IN FEET.

The diagram at left, made by the Citizens Committee on City Plan of Pittsburgh, shows the difference between an athletic center and a playground. The Committee says this difference should be recognized and taken into account when planning and developing all the city's play spaces. For the sake of efficency and economy it is suggested that the playgrounds be made in groups of three units, preferably located near a school. The city needs the junior playgrounds (for boys and girls under ten years) in greatest number. It needs the senior boys' and senior girls' playgrounds in next greatest number. And the larger athletic field centers, together with the swimming pools, should be less frequently distributed throughout the city, because these facilities will attract people from greater distances than will the playgrounds.

The Committee suggests that one acre of usable land—that is, exclusive of the slopes that are made by grading or the natural unusable slope of the site—should be taken as a minimum area for each playground unit. A three-unit site requires three usable acres if it is to be efficient and economical to operate. For an athletic center five usable acres is a minimum.

In the diagram reproduced on page 815, the Committee shows how the question of grading determines the amount of usable land as well as the cost of the site; and it suggests that, unless some proper minimum size is accepted for efficient operation, the city will likely blunder along into undue multiplication of sites with attendant excessive costs for improvement, maintenance, and administration.

Public Desire to Get Something While the Getting Is Good

This factor is so dominant, so clearly recognized, and so inherent in the chaotic and undisciplined structure of our government, that it need only be mentioned.

Short-sighted and Alleged Practicality

This factor would be deserving of analysis if space permitted. It is enough to state categorically that: (a) the possessor of the soundest understanding of a subject is best prepared to make genuinely practical compromises; (b) a reasonable amount of logical foresight is essential to wise and practical decisions; and (c) compromises arising from purely political expediency are almost always fatal to any real understanding of problems which demand technical competence and technical integrity for their solution.

Conclusion

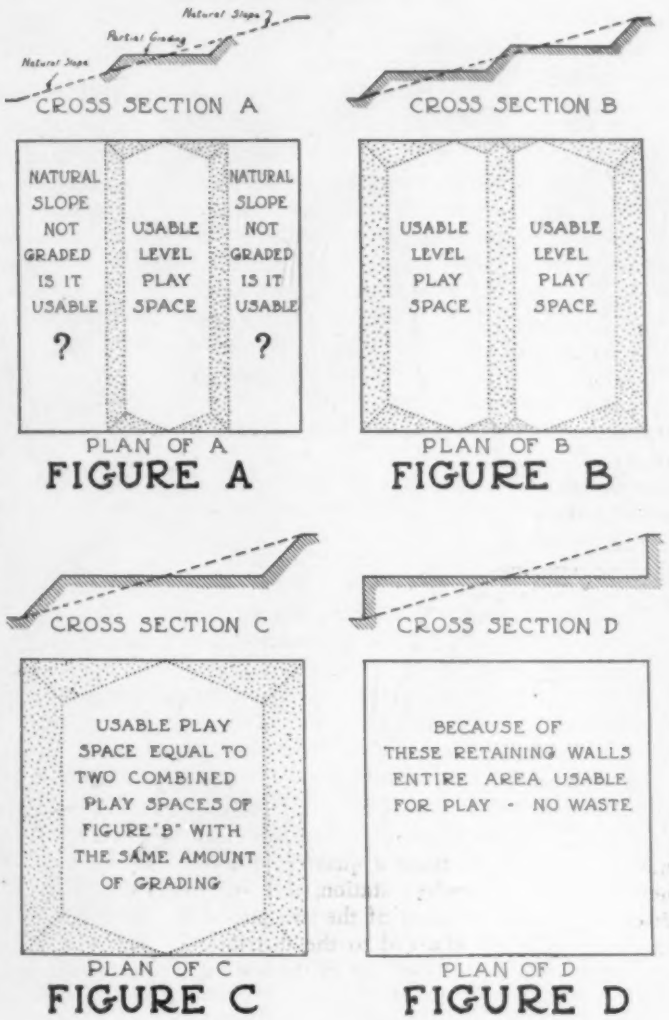
Although the Citizens Committee on City Plan has been trying for six years to encourage recognition of the determining factors with respect to the physical recreation system, and has made simple and obvious demonstrations such as are here reproduced, the net result is not encouraging. It suggests that city planning can be and has been used more to stimulate nebulous but insistent public demands than to encourage technical competence. Undue multiplication of sites in view of the size and character of those purchased, future excessive administrative costs, less efficient administration, waste of money or undue isolation of city credit until grounds are developed to a serviceable state—these and other penalties are paid because the municipal procedure is not specifically designed to avoid them.

IMPORTANCE OF GRADING RECREATION SITE

Figure A shows what partial grading means in terms of usable land. Partial grading is very unwise unless it is done as a step toward the progressive completion of a complete grading scheme, according to a plan which shows what the final development and condition of the recreation site is to be.

Figures B and C show complete grading schemes, the former showing the site made into two usable level play spaces, the latter showing the usable space at one level. The dotted areas indicate unusable slopes which, if not too steep, might be planted with trees and shrubbery. The advantage of the one-level arrangement is that it permits a more flexible subdivision of the play space between large or small groups of the three classes that are to be accommodated (senior boys, senior girls, junior children under ten years). If the parts of a three-unit playground are placed at different levels, the problem of supervising them all by one person becomes difficult, if not impossible; and sometimes the city will not desire to provide full-time employees for each unit of such a group. A two-level scheme is most workable if used for a large site where an athletic center is placed on one level and the playground units are placed on the other level.

Figure D shows how practically the whole area of a site may be made into usable play space by building retaining walls. This expensive procedure should be considered where a site is smaller than it should be. If sketch plans of a site's final development are properly made, this factor can be foreseen. If foreseen, there arises a question of judgment. For example, a site when fully developed may have a capacity so small as not to warrant such development at all, but rather to justify getting rid of the site altogether. Again, if the cost of retaining walls be calculated in addition to the purchase price of the site, then it may be wiser for the city to acquire more expensive land which entails less development cost rather than cheap land entailing heavy development cost.


Natural Slope
Partial Grading
Natural Slope
CROSS SECTION A
CROSS SECTION B
NATURAL SLOPE NOT GRADED IS IT USABLE ?
USABLE LEVEL PLAY SPACE
NATURAL SLOPE NOT GRADED IS IT USABLE ?
PLAN OF A
FIGURE A
USABLE LEVEL PLAY SPACE
USABLE LEVEL PLAY SPACE
PLAN OF B
FIGURE B
CROSS SECTION C
CROSS SECTION D
USABLE PLAY SPACE EQUAL TO TWO COMBINED PLAY SPACES OF FIGURE "B" WITH THE SAME AMOUNT OF GRADING
PLAN OF C
FIGURE C
BECAUSE OF THESE RETAINING WALLS ENTIRE AREA USABLE FOR PLAY - NO WASTE
PLAN OF D
FIGURE D

MAIN PUMP-STATION, CONTROL TANK AND TRANSFORMER HOUSE AT THE WORTENDYKE STATION, RIDGEWOOD, N. J.

The New Water-Supply System of Ridgewood, New Jersey

By E. J. Fort

Executive Engineer, Village of Ridgewood, N. J.

THE original water-supply system of the village of Ridgewood was built by the Bergen Aqueduct Company in 1900 and was operated by it until 1921, when it was purchased by the village. It served, as it continues to do, not only the village of Ridgewood but the adjoining villages of Glen Rock, Hohokus, and Midland Park, having at the present time altogether a population of approximately 20,000.

Water was obtained from deep wells, twelve of which were located in the easterly part of the village near the Hohokus Brook, at what is known as the Harrison Avenue pumping-station, and twelve others about two miles west of this point in the village of Midland Park on a small stream known as Diamond Brook, at the Wortendyke pumping-station.

These wells were all 8 inches in diameter and from 125 to 500 feet in depth. They were supposed to have been cased with heavy wrought iron pipe to rock to exclude surface water. Some of the casings, however, leaked badly, as was apparent from the color and taste of the water at certain seasons of the year. They were pumped by suction by Worthington reciprocating steam pumps.

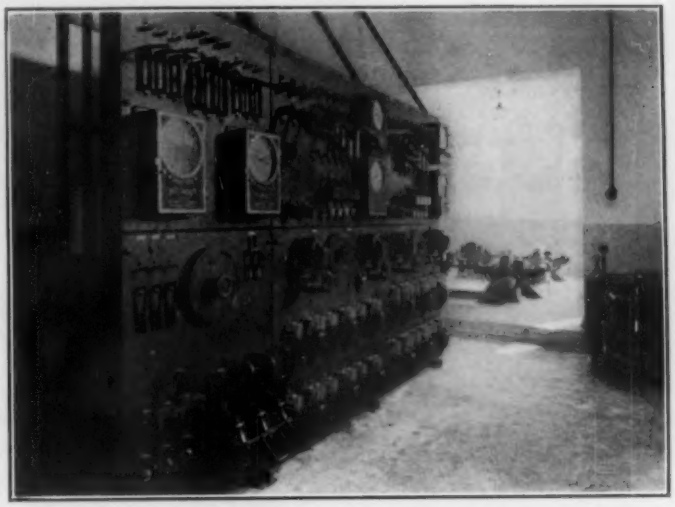
A steel standpipe located on Aqueduct Avenue, Midland Park, about a quarter of a mile north of the Wortendyke station, received the discharge from the larger of the two pumps at this station and discharged to the distribution system serving the greater part of the low-lying portions of these municipalities. A small standpipe located at the highest point of Glen Avenue received the discharge from the smaller pump at this station and served the highest portions of Ridgewood and Midland Park. The pumps at the Harrison Avenue station discharged directly into the mains leading to Hohokus and to a standpipe located on Valley View Avenue.

The amount of water which could be obtained from this system during the months when the demand was greatest was limited to about 1,250,000 gallons per day. While analyses did not show marked pollution, its quality was such that the use of chlorine was considered necessary.

New Supply Sought

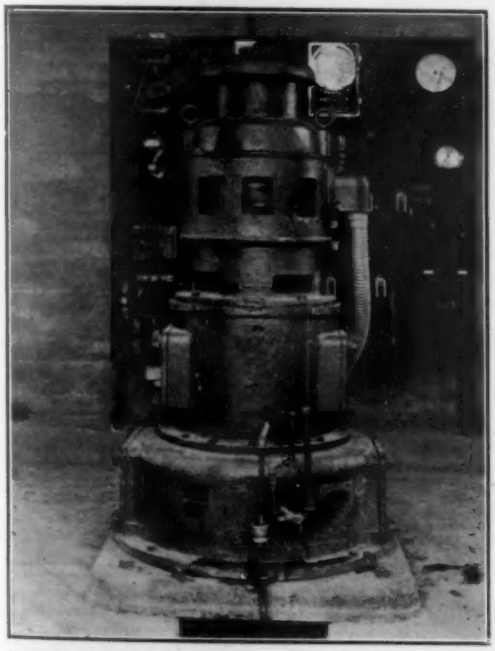
The municipalities served by the system have had a fairly rapid growth for a number of years, and in 1925 the maximum supply available was barely sufficient to supply the demand. It had been necessary during the summer season to limit the use of water, and it seemed certain that a serious shortage of water would occur during the summer months when it was most needed, unless the supply were increased promptly. An investigation of the various sources of supply available seemed to show that, from the standpoint of economy, the quality of water obtainable, and the possibility of increasing the supply as required for years to come, a deep-well supply was the most desirable.

The red sand rock of the valleys of the Saddle River and the Hohokus Brook, both of which streams flow through the village, have been bored for water in numerous locations and have always produced water in liberal quantities. Flowing wells are frequently found along these streams. It did not seem unreasonable to expect, therefore, that by drilling wells of greater diameter and depth than the old ones in favorable locations and by the use of turbine deep-well pumps a satisfactory supply could be obtained within the area covered by the distribution system.



MAIN SWITCHBOARD AT THE WORTENDYKE STATION
The high-pressure pump-room is seen in the background

Upon invitation of the Commissioners of the village, representatives of one of the largest firms engaged in the construction of deep-well water-supplies made a careful examination of conditions affecting the production of water from deep wells in the vicinity of the village and expressed the belief that the amount of water desired could be produced. It was stated that the firm was willing to enter into contract to produce at least 2,500,000 gallons of water per day, 2,000,000 of which would be produced on the grounds of the Wortendyke pumping-station and 500,000 gallons per day from two wells located in the easterly part of the village, one near the Saddle River and one near the Hohokus Brook.



A SIX-STAGE AMERICAN 16-INCH TURBINE PUMP WITH PRESSURE CONTROL, INSTALLED AT RIDGEWOOD, N. J.

Upon receipt of this proposition from the contractor, the Layne & Bowler Company, the Commissioners decided to proceed along these lines, and plans and specifications were prepared calling for a guaranteed supply of at least 2,500,000 gallons of potable water per day from deep wells.

The salient features of this contract were:

1. The amount of water guaranteed was to be produced as a condition precedent to the contractor's right to receive any compensation whatever from the village.

2. The quality of the water should be such as to satisfy the requirements of the State Board of Health for public water-supplies.

3. The contractor was not limited as to the number and exact location of the wells required to produce the guaranteed amount, beyond a certain minimum amount from each well.

4. The contractor agreed that the water production shown upon a twelve-hour test at the completion of the wells should be maintained throughout a period of one year, and if at any time during that period the production fell below the guaranteed amount, additional wells should be constructed and equipped sufficient to produce the required amount without additional cost to the village.

5. The contractor guaranteed to produce water at the various pressures required, 60, 80 and 100 pounds per square inch, by the expenditure of a given amount of power (kilowatts per 1,000 gallons).

6. The contract provided for compensation to the contractor for water produced in excess of the guaranteed minimum and up to a maximum of 1,750 gallons per minute at a price bid.

7. All wells were to be cased with heavy wrought iron well casing 16 inches in diameter to solid rock and sealed against all leakage of water from earth strata above, to the satisfaction of the engineer. They were to be 12 inches in diameter in rock, and pumps were to be submerged at least 10 feet below the lowest water plane.

8. The contractor was required to furnish and install all electric machinery and apparatus required for automatic operation, all of which was specified in detail. All structures such as deep-well pump-houses, high-pressure pump-house, transformer house, control tank, standpipe, venturi meters, etc., were furnished by the village under separate contracts.

Two bids were received for this contract.

That of the Layne & Bowler Company, of New York, was as follows:

For the deep-well and pumping system complete, $147,000.
For water produced in excess of guarantee, $5.00 per gal. per minute.
Kilowatt-hours per 1,000 gallons of water delivered at 100 lbs. per square inch..... 1.8
Kilowatt-hours per 1,000 gallons of water delivered at 80 lbs. per square inch..... 1.6
Kilowatt-hours per 1,000 gallons of water delivered at 60 lbs. per square inch..... 1.4

That of the New Jersey Artesian Well Drilling Company, of Paterson, N. J., was as follows:

For the deep-well and pumping system complete, $119,000.
For water produced in excess of the guaranteed amount, nothing.
Kilowatt-hours expended per 1,000 gallons of water delivered at 100 lbs. per square inch..... 1.7
Kilowatt-hours expended per 1,000 gallons of water delivered at 80 lbs. per square inch..... 1.6
Kilowatt-hours expended per 1,000 gallons of water delivered at 60 lbs. per square inch..... 0.95

The lower bid was accepted and the system has now been completed and placed in operation. The contractor stated in his proposal that the bid was made anticipating that it would be necessary to construct eleven wells; that should it be found necessary to construct only nine wells, $12,500 would be deducted from the price bid, and that if it were found necessary to construct only seven wells, $25,000 would be deducted from the contract price. As a matter of fact, it was found necessary to construct only five wells, and the contract price was therefore reduced to $94,000.

New Wells

The first well drilled near the Saddle River produced under a twelve-hour test 975 gallons per minute, or at the rate of 1,404,000 gallons per day, without lowering the water-level more than fifteen feet. The second well, near the Hohokus Brook, produced 435 gallons per minute, or at the rate of 626,400 gallons per day. Each of these wells was guaranteed to produce at least 175 gallons per minute.

Owing to the fact that these two wells were located at points remote from the main source of supply, the Wortendyke station, and were designed to pump directly into the distribution system against a pressure of from 80 to 100 pounds per square inch, and that the mains into which they discharge are comparatively small, it was decided to equip them with pumps having capacities of only 350 and 250 gallons per minute, respectively. One of these pumps is a 4-stage, 16-inch turbine pump manufactured by the American Well Works Company, with a "Kingsbury" head, and is set only 40 feet below the surface and with about 40 feet of suction pipe. The second well is equipped with a 12-inch pump of the same kind, having 7 stages and set 64 feet below the surface, with similar suction pipe. Discharge mains are 8 inches in diameter. Both have automatic pressure control capable of adjustment to throw in and out of service between a wide range of pressures. They are designed to be standby pumps and will stand idle the greater part of the time. They will be thrown into service only at time of heavy draft on the system during a fire or periods of heavy draft at times of drought when pressures are low. The pressure regulators have proved to be very sensitive and reliable and have never failed to throw the pumps into service when the lower limits of pressure were reached.

The switchboards are equipped with: 1 main-line knife-switch; 1 single-pole pressure regulator; 2 inverse time-limit overload relays; 1 Pri-zis-tor type automatic starter; 1 single-pole double-throw manual control switch for manual control of automatic starter independent of pressure regulator; 1 Public Service watt-hour meter; 1 set of fuses for connection inside the meter loop; 1 pressure-indicating gage. Each station has an 8-inch recording and integrating venturi meter and depth-of-water gage.

The two pumps deliver water at a pressure of 80 pounds per square inch by the expenditure of 1.3 kilowatt-hours and 1.45 kilowatt-hours per 1,000 gallons, respectively. They are driven by General Electric vertical squirrel-cage motors. The current is furnished by the Public Service Electric Company of New Jersey and is 220 volts, 60-cycle, 3-phase.

Pump-Houses

The deep-well pump-houses are heated by electric heaters with thermostatic control. An operator visits the pumps each day, starts the

motors, oils the machinery when needed, and notes that operation is satisfactory, otherwise they receive no attention.

The three wells at the Wortendyke station delivered upon test 845, 625, and 520 gallons of water per minute, or, altogether, 2,865,600 gallons per day. They are of the same diameter and approximately the same depth as those on the east side, described above, and are equipped with the same kind of operating machinery. Their operation is controlled in a different way, however.

The three pumps discharge into a concrete control tank having a capacity of about 60,000 gallons. On the roof of this tank are located three float switches, each of which is set to throw the motor of a deep-well pump into or out of operation when the water in the tank reaches a certain level. The head against which these pumps work is small, being at no time greater than 10 pounds per square inch, exclusive of the suction lift.

Water is drawn from the control tank by horizontal single-stage centrifugal pumps which are operated by General Electric horizontal slip-ring, drum-control motors, which discharge into standpipes and directly into the distribution system, one at a pressure of about 60 pounds per square inch and one at a pressure of about 100 pounds per square inch. These pumps are controlled by float switches in the standpipes.

The main switchboard is located in a small room adjoining the pump-room and is equipped with Sundh switches, graphic watt and volt meter, and pressure gages. It also contains: 2 three-pole fused main-line knife-switches; 2 pairs of duplex inverse time-limit overload relays; 2 two-pole single-throw not-fused knife-switches for control of the motors at the panels; 2 relays to prevent starting of motors on single phase; 1 disc type transfer switch so arranged and wired that the two float switches controlling each panel and the two motors controlled by it may be transferred; also 1 disc type transfer switch for the transfer of switches controlling motors of deep-well pumps; and 2 automatic starters, each provided with an auxiliary contact arranged to close with the last step of the starter.

A 12-inch venturi meter measures the discharges from each pair of pumps. There are four high-pressure pumps, so that at all times there are two standbys. Twenty-five hundred-volt, 2-phase, 60-cycle electric current is supplied by the Public Service Company and is transformed by the village to 440-volt, 3-phase, 60-cycles for use in the motors of all pumps.

STANDPIPES FROM WHICH THE HIGH-PRESSURE PUMPS ARE CONTROLLED

The water from four of the five wells has been found to be without contamination and has been approved by the State Board of Health for use without treatment. One well shows some contamination, and the water will be chlorinated.

This system has been in operation for about eight months. The entire water-supply during that time has been furnished by two wells at the Wortendyke station, the third well having been pumped to waste in an effort to clear up the slight pollution of the water. During a period of more than one month one well furnished the entire water-supply for the four villages.

Further Expansion

It is usually considered by those most familiar with water-supplies from deep wells in rock that the volume of water obtainable varies comparatively little from year to year and during the seasons of each year from that shown on a twelve-hour test after completion. In one

case that has not proved to be true, however, as the capacity of at least one of the three wells at the Wortendyke station has decreased materially in the last two months, during which time precipitation on the watershed, and, in fact, throughout this whole region, has been very small. A supplementary agreement has therefore been entered into with the contractor to construct two additional wells, for which he will be paid the sum of $25,000 if the present wells, as now seems unlikely, continue to produce the guaranteed amount throughout the guarantee period, one-half that amount if four wells are required to produce this amount of water, and nothing if all five wells are required to do so. The two wells are now under construction.

They seemed to be necessary for another reason also. Owing to the fact that a large proportion of the whole supply at this station was produced by one well, if it was put out of commission for repairs or for other reasons, the remaining two would be unable to meet the demand. It is thought probable that by drilling these wells to greater depths than the others, new veins of water will be encountered which will furnish an additional supply entirely independent of that which is now drawn upon. It is one of the conditions of the supplementary agreement that the new supply shall not affect the one already obtained, through reduction of quantity or quality.

Operating Costs

The automatic apparatus at this station has operated with entire satisfaction, and all its functions are performed with regularity. One stationary engineer and one helper are found sufficient for its operation, whereas six firemen and two engineers were required to operate the two old steam-operated stations.

The cost of water in Ridgewood (30 cents per 1,000 gallons) has always been high, principally because of the large interest charge upon the bonds issued to pay for the original plant and the high cost of operation, and it was the purpose to reduce this charge when the new plant was put into operation. The price of electric power is so high, the volume of water pumped and the amount of power used being comparatively small, that it was not possible to do this. It will be possible, however, to maintain the former rates and meet all expenses connected with the construction of a new system with three times the capacity of the old one. As the tributary population and the income from the sale of water are increasing rapidly, we expect to be able to reduce the rates the next few years and to increase the payments to the sinking-fund sufficiently to pay the bonds as they fall due.

The cost of the entire plant when completed, including buildings, discharge mains, and all other items not included in the main contract, will be approximately $150,000.

Urging Public Cooperation with Health Departments in Swimming-Pool Sanitation

THAT no one with a cough, cold, infected eyes, ears or skin or any other infectious disease should use a public swimming pool was urged by Arthur S. Bedell of the Division of Sanitation of the State Department of Health of New York, in a health talk which was broadcast over the radio.

"As a means for providing healthful recreation for large numbers of people, the swimming pool is taking first rank in civic life, for swimming is one of the most healthful exercises," said Mr. Bedell. "In making use of these public or private institutions, citizens have a right to assume that all due precautions for health and safety have been taken by those in charge. Is this faith justified in your community?

"Scum gutters, a circulating water system provided with filtration and sterilization apparatus, specially designed inlets and outlets, and a vacuum cleaning apparatus, when properly designed and utilized, should maintain the water and the pool in a safe sanitary condition for your use. If bathing-suits are used they should be of undyed, lintless material. If you use suits provided by the pool management, be sure that they are laundered and sterilized before each use.

"The modern artificial swimming pool is no longer a mere tank filled with water. Great care is now taken in the design and construction. The use of a white-tile lining facilitates cleaning and increases the pool's attractiveness and safety.

"A swimming pool is a place for recreation and not a bathtub to cleanse the body. The suitable use of shower-baths and toilet facilities by the patrons is essential in swimming pool sanitation. A swimming pool offers you the pleasures, without the dangers, of the old swimmin' hole. Make the most of it, but do not endanger the health or safety of your fellow citizens by any thoughtless act or disregard of sanitary regulations."

3,219 Swimming Pools in 968 Cities

are listed in a tabulation of swimming-pool statistics in THE MUNICIPAL INDEX for 1927. For each city listed, the number of indoor and outdoor pools is shown; also those municipally and privately owned.

The same volume contains the full text of a report of some 11,000 words on Standards for Design, Construction, Equipment and Operation of Swimming Pools by the Joint Committee on Bathing Places of the American Public Health Association and the Conference of State Sanitary Engineers.

Proposed Water-Supply Improvements at Westfield, Mass., Involve Large Earth Dam

By C. A. Farwell

Fay, Spofford and Thorndike, Consulting Engineers, Boston

WHAT will be one of the high earth dams of the eastern United States is projected as part of a development to increase the water-supply of the city of Westfield, Mass. Westfield is a city of about 20,000 population, situated at the easterly foot of the Berkshires eight miles west of the Connecticut River. It is fortunate in being sufficiently near to the hills to be able to draw on them for a gravity supply of excellent water.

The older and original source of supply, developed about 1875, is a drainage area of 4.8 square miles located northwesterly of the city. Storage is provided for 40 per cent of this watershed, the reservoir having a capacity of approximately 125 million gallons. From the storage reservoir the water flows along the brook bed for a distance of 2½ miles, dropping in this distance 480 feet, being thus naturally aerated. A small dam diverts the flow into the supply main. This system supplies about 1.15 million gallons per day.

About 1898 the city was confronted with the problem of securing an additional supply and decided to use the water of Tillotson Brook, a small stream six miles southwesterly of the center of the city. It was not necessary at that time to do other than divert the natural flow of the stream into the supply main running to the city, as from the watershed of six square miles sufficient water was obtained, even at times of low flow, to supplement the older system and provide an ample supply.

Within the last few years, however, the city has reached a point of such demand that it is desirable to provide an additional supply to meet the emergency requirements with which any city is sometimes confronted. As originally contemplated in 1898, the proper means of increasing the supply was found to be the provision of storage on Tillotson Brook to retain the higher flows and make them available for low-water periods.

Site of New Project

About 2,300 feet upstream from the present diversion dam, another brook enters Tillotson, and the valley is so formed that a dam at the junction will provide a feasible reservoir site, flooding the triangle of valley floor immediately above the junction and the separate valleys of both brooks for a considerable further distance.

The geology is that of a glaciated region, there being no uniform stratification. The floor of the valley is of boulder clay resting on schist bedrock which is generally at a depth of about 20 feet below the bed of the streams, although rising to somewhat higher elevations on the southerly side. The slopes are of sandy and clayey material with some gravel, but in general, particularly on the easterly side, the material is quite impervious. One proof of this is the fact that water was retained for long periods in test pits well up on the slope. There

is, however, one important exception to this imperviousness in that on the southerly side of the reservoir, beginning about 1,000 feet above the dam site, is a deposit of "esker" material—coarse sand and gravel—through which there will probably be some seepage. This seepage will not find its way back into the brook above the diversion dam, and if in the future it is found to be excessive, the area may be blanketed in order to save the water.

The Flow

Stream gagings, taken over a period of ten years, show a monthly average brook flow of from 19 million gallons down to 0.65 million gallons per day.

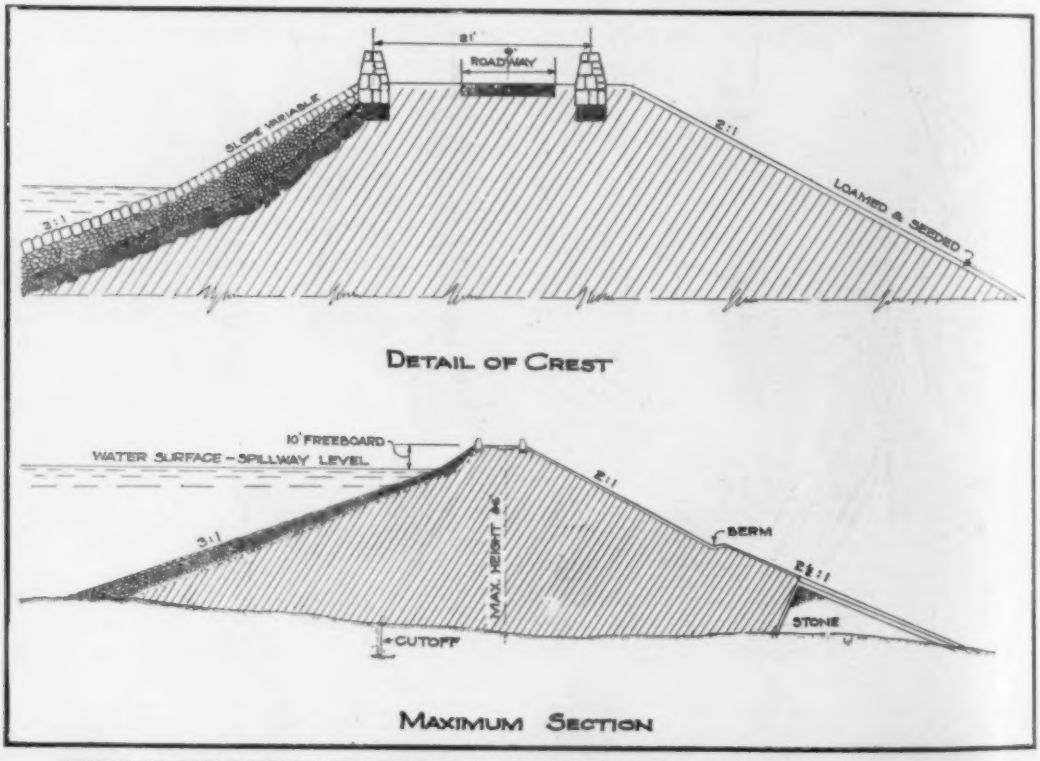
A dam about 100 feet high at the proposed site would form a reservoir having a capacity—with reasonable drawdown—of about 1,100 million gallons, giving an available continuous flow of about 5.5 million gallons per day. It was not thought desirable, however, to provide at this time for this amount, as a forecast of probable consumption showed that it would not be needed before the year 1975. Provision is being made to meet the estimated demand of the year 1955, requiring a continuous flow from the Tillotson Brook system of about 4 million gallons per day. To furnish sufficient storage to insure this flow, a dam about 80 feet high is needed. The reservoir formed by this dam will have a capacity—with a drawdown of 30 feet—of 500 million gallons; its area being 75 acres.

In providing spillway capacity an extreme flood flow of 400 cubic feet per second per square mile, or a rate of 1,560 million gallons per day, is provided for. This gives a large factor of safety.

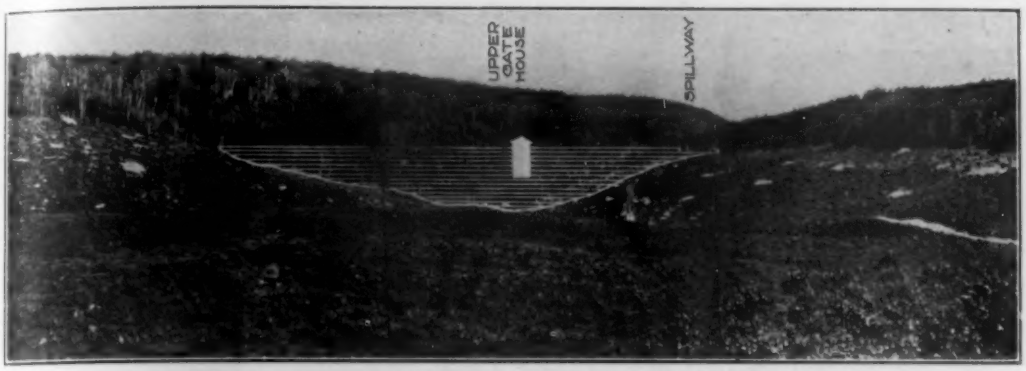
General Requirements of Design

It was decided that the 80-foot dam, with its appurtenant structures, should be built in the near future, with the idea that in the more distant future it could be raised to the 100-foot height needed for full development of the watershed. The dam, therefore, was so planned as to permit the addition of material at the top and on the downstream portion without emptying the reservoir. The gate-house and spillway are so arranged that they may be removed or extended to the higher elevation when required, with the least reasonable cost.

From the gate-house at the downstream toe of the dam it may be desirable to pass the water to any of three channels: to the bed of the brook along which it will flow to the existing diversion dam; to a pipe line connecting to the present supply main directly at the diversion dam, thus giving an additional head to enable



DETAIL OF CREST AND MAXIMUM SECTION OF PROPOSED EARTH DAM AT WESTFIELD, MASS.



UPSTREAM VIEW, SHOWING LOCATION OF PROPOSED DAM AT WESTFIELD, MASS.

the supply pipe to the city to carry more water than it can under present conditions; or to an aerator, if later it is found that one is needed.

The Dam

Numerous borings were made and test pits were dug to determine the underlying material both at the site of the dam and at the proposed site of the borrow-pit. Subsurface conditions at the dam affected to a slight extent the location, which would otherwise have been controlled by the topography. One end was moved a short distance from the location giving the minimum yardage in order to avoid a pocket of somewhat less impervious material.

The test pits in the proposed borrow area disclosed that material would be available of sufficient imperviousness to warrant the omission of a core wall. It is the intention to place the best material in the upstream portion of the dam, but in general the materials will not be segregated, except that the downstream toe will be of rock, and the upstream face will be protected with a layer of rock, the exact thickness of which will be determined by the amount of stone available from the borrow-pit excavation.

A concrete cut-off down to rock will be built across the floor of the valley to insure the blocking of any underground water channels, the existence of which, however, is very much doubted. On the slopes of the valley the type of cut-off to be used will be determined during construction after examination of the material encountered.

Along the top of the dam there is provided a roadway with stone walls—the old New England type—along either side, the wall on the upstream side serving to increase the freeboard beyond the nominal 10 feet. The upstream slope of the dam is made 3:1 except in the upper 10 feet, while that of the downstream slope is 2:1 and 2½:1, with a berm and gutter between. This downstream slope is to be loamed and seeded.

Outlet Conduit and Gate-Houses

The location of the bedrock is such that the outlet conduit can be placed on or in it beneath the dam. The conduit will consist of a 42-inch circular pipe formed of reinforced concrete and a 24-inch cast-iron pipe imbedded in concrete.

The necessary inlet structure is provided to turn the flow of the brooks into these pipes during construction. After construction, the 24-inch pipe between the upstream toe and the upper gate-house will be abandoned, the 42-inch pipe being available as a blow-off to drain the reservoir if desired.

At the upper gate-house several openings at different elevations are provided in order that the water may be drawn from any depth beneath the surface. It will pass through coarse racks on the outside of the gate-house and through a set of screens within, after which it will pass into the 24-inch pipe leading out through the base of the dam to the lower gate-house. The 42-inch blow-off pipe will have valves at the upper gate-house and will discharge into the brook bed below the downstream toe of the dam. The main valves in the upper gate-house are in duplicate as a factor of safety. All valves except some small clean-outs are to be operated from valve-stands on the floor of the gate-house. The reinforced concrete substructure, valve-stems, etc., can be extended upward when required, although it will be necessary to take down and rebuild the superstructure itself. A crane is provided to handle screens, valves, and other parts as may be necessary. Access to the upper gate-house will be by means of a light structural steel bridge from the crest of the dam, designed with the idea that it would be raised to a higher level when the dam is raised to the ultimate height.

The Spillway

Rock is not available at the proper elevation

in which to locate the spillway, which is placed in natural material at the end of the dam and is well protected against seepage by cut-offs. The spillway is to have a length of 60 feet and is so designed that when the dam is raised the 18 feet proposed, the present concrete lip will be the base of a future small ogee dam, which dam will form the future spillway. The small reinforced concrete bridge over the spillway may be raised to the new height and location or may be destroyed and rebuilt. Below the spillway, a concrete-lined channel is provided leading the water well away from the dam and discharging it into the brook below the lower gate-house. This channel is to be lined with concrete except where it is in rock, and special precautions are being taken by the provision of collars and weepers to prevent any possibility of pressure behind the lining or of water following along under the lining. The spillway channel is made amply large to remove any chance of overtopping with resulting erosion of the downstream side of the dam.

Other Features

A drain is provided in the stone toe at the downstream side to catch all seepage. In this way any dangerous conditions can be detected and the ordinary seepage can be measured, if desired, as a guide in the design of the future extension to the higher elevation.

The roadway across the top of the dam is not planned for use by the general public, and therefore only a small width is surfaced. Connections with existing roads are provided at each end, with the necessary catch-basins and drains to care for surface drainage.

It is hoped that the natural flow of the stream may be used by the city during construction, and with this in mind the specifications have been very carefully written to enable the city to control the health and sanitary conditions in the contractors' camps.

It is planned to strip the site of the reservoir of surface material from above high water to about 10 feet below and in addition to grub out roots, etc., to the lowest level to which water will be drawn. Certain small swampy areas in the floor of the valley will be covered with gravel or sand instead of removing the vegetable matter, and it may prove more economical to blanket areas around the edge in lieu of stripping.

Some of the more important quantities involved are given below:

Earth embankment	240,000 cu. yds.
Stone embankment	33,000 cu. yds.
Concrete	5,600 cu. yds.
Reinforcing steel	85 tons
Grubbing	60 acres
Stripping top soil	100,000 sq. yds.

Organization

The work will be in charge of the Board of Public Works of the city of Westfield, consisting of John L. Barry, Chairman, J. O. McKean, and Edward E. Hinsman; Oren E. Parks being Superintendent. The writer's firm served as engineers on the investigation and design, and Dr. Charles Terzaghi, an authority on soils, was called in consultation. The project has been approved by the County Commissioners of Hampden County and is now awaiting action by the city government.

County Officials' Section of A. R. B. A.

THE American Road Builders' Association, Earle Building, Washington, D. C., feels that the present interest and the demand of conditions in the United States call for the organization of a division of the Association devoted to the work of county officials. The great amount of good accomplished by the American Association of State Highway Officials in the construction and maintenance of state highways is evident. With systems completed in some states and great progress in others, it seems quite logical that more attention will be given to the secondary road systems.

A national association of county officials under the auspices of the American Road Builders' Association would standardize methods and materials and would bring about the same amount of good in county road systems as the state highway officials' organization has brought about in the primary routes. Therefore, the American Road Builders' Association is organizing a Division of County Officials and a preliminary meeting for this purpose and for electing the first officers will be held in the offices of the American Road Builders' Association, Earle Building, Washington, D. C., on Friday, June 17, 1927, at 10:30 A. M.

The Old and New Slogans in Municipal Development

The Booster's Slogan

"Let's put our city where it belongs on the map."

The Planner's Slogan

"Let's put the map where it belongs on our city."

The Cleveland Reservoir

By Elbert Peets

[EDITORIAL NOTE.—*We are indebted to "The Nation" for permission to reprint Elbert Peets' description of the Cleveland Reservoir as seen through the eyes of an architect and writer. So few taxpayers ever see the interior of such a structure as the Baldwin Reservoir in Cleveland that a description such as that published below will open their eyes to the beauty of a structure designed strictly for utilitarian purposes. Mr. Peets is co-author with Werner Hegeman of a book on "Civic Art."*]

OUR drinking water, in Cleveland, is stored in a covered reservoir. The reservoir keeps the water clear and cool, and to do that as effectively and economically as possible is its only reason for existing. Quite incidentally, it is an architectural masterpiece.

It is called the Baldwin Reservoir. (Actually there are two, but I shall use the singular number because they are exactly alike.) It is a subterranean room about five hundred feet square, surrounded by concrete walls, paved with concrete and covered with a roof of intersecting flattened barrel-vaults of concrete carried on round concrete piers. The crown of the vaults is forty feet above the floor. The piers, which are thirty inches thick, are about twenty feet apart both ways. The only openings are a few small manholes in the ceiling.

The beauty of the Great Hall of Cleveland is first of all in its vast extent—its six hundred columns, its fifty aisles. But it has delicacy, too. The aisles are pleasantly proportioned in cross-section. The columns are spread conically at the floor, an unpleasant shape but at a distance softening into a simplified diagram of an architectural column base. At the top there is a rather bungling transition from round to square to meet the square springing of the vaults, but here again, with almost pathetic lack of affectation, the esthetic function of a capital is expressed.

There is nothing quite like it anywhere. Each aisle has about the proportions of the side aisles of a moderately high Gothic church, Winchester Cathedral for example, though the flattened vaults remind one of later Gothic buildings such as St. George's Chapel, Windsor. But for the great area, the forest of equi-spaced columns, the precedents are ancient. That is a hot-climate, Mediterranean idea. The great hall in the temple of Ammon at Karnak was 160 by 320 feet and contained 134 columns. The Hall of a Hundred Columns at Persepolis had just a quarter the area of the Cleveland hall, but its ceiling was twenty feet higher.

For the "public inspection" in 1925, before the reservoir was flooded, a few aisles along the west wall were lit by hanging an electric bulb close to the ceiling in every fourth or fifth bay. The rest of the hall was dark save for a few "Jove's eyes" where manholes had been left open. The warm yellowish electric light spread out from each of the lit bays and laid a net of radiating column shadows on the floor. The curved shapes of the springing vaults, caught by the shadows of the vaults nearer the lights, produced a fantastic mosaic of interwoven spots and lines varying from bright gold through every shade of warm gray to deep, soft black. The columns were halved and quartered by the shadows of other columns or were picked out of the darkness by narrow tangent strips of light.

In search of new aspects I wandered out from the lit bays into the dark forest of columns. A dozen bays deep in it, when I looked back along an aisle I saw a bluntly bullet-shaped area of warm, gray concrete wall, streaked with vertical shadows and framed by the lighter lines of the more directly lit columns near it. Nearer me the columns became less and less light. There was a similar gradation of light in the ceiling, not uniform but flecked with light and dark as rays or shadows caught the surfaces of the groined vault. Across the bottom of this deep stage-setting moved a line of little people silhouetted against the bright wall, so far away that I could not hear their voices or tell whether they were looking out into the darkness toward me.

Another fine view was from north to south along a dark aisle in which there was an open manhole in the top of the last bay. Everything around me was jet black. In the distance again the bullet shape, this time not of warm light but cool silver, the white light streaming down through the manhole and along the gray columns, spreading out on the floor to form a

white line from one base to the other.

The view which had most of "art" in it was a concrete standpipe, seen from about two hundred feet away, along the aisle in which it stood. The front of the enormous pipe was lit by an open manhole just above it. The white light flooded down along the gray cylinder, broken only by the black, drooping shadow under a flange-offset ten feet from the top. Each side of the cylinder darkened into shadow, but just at the turning was a pale line of ruddy light from the electric bulbs. On the floor some ponderous valve-affair served as altar and a dark crowd of pigmy worshipers stood with heads uplifted as the high-priest chanted, "Ten million cubic feet, two million dollars." . . . Everywhere I was surrounded by a star of diagonal vistas, narrower, more sharply crowned, more Gothic than the views down the aisles.

No architect ever lived who would not stand in silent wonder in this Hall of Six Hundred Columns. It is an abstraction, a song in some nameless mother-language that everyone understands. It is the work of a law, of a formula ruling over space and mass—rather, perhaps, a law brought into the range of our feelings by being stated in the most fundamental, most simple terms of human need for formal perfection. It is the product of man's desire for order, freed from the old conventions of architecture by the new conventions of engineering.

The great beauty of the reservoir is its simplicity and purity. Nothing is petty, nothing is irrelevant, nothing is boastful, nothing tells a story, nothing numbers the names of gods, men, or races—nothing is human. There are no windows, no doors, almost no light, no sign of human use, not even a stone cut small so men could lift it. And yet it is superbly human. Beside it the formless jumble of nature becomes a congeries of wilful antics. It is so human that in an hour it became very dear to me. Its floor's level firmness gives my body the safest and most assuring relation to the earth; the solid ceiling, curving from pier to pier, does not weigh upon me and yet protects me from all unknown things of the air. The strong, round columns seem human, make me feel taller and stronger. My eye follows them as they march away into the shadow and I actually touch and measure and embrace the space that surrounds me. I live at last in a cosmos.

Easy Handling of Excavation for Street Widening

WIDENING VERNOR HIGHWAY, DETROIT, MICH., THIRTY-TWO FEET

The machine illustrated is a Model 16-B convertible Bay City excavator equipped with a ¾-yard skimmer scoop. It is being used by the Department of Public Works of Detroit, for excavation connected with the street widening of the Vernor Highway program. Houses, stores and buildings have been moved back and the pavement right of way correspondingly increased. The Bay City machine is making a cut which will increase the pavement width by 32 feet. The excavation is unusually difficult because it is necessary for the machine to break up and load concrete, tree stumps and roots, sawed-off telephone poles, and foundation piling on which the houses formerly rested. The Bay City machine is loading three 5-ton trucks to every 2-ton truck loaded by a full-revolving steam shovel on the same job. It is leaving an even grade and is handling the concrete without extra labor, whereas a compressed-air outfit has been used ahead of the steam shovel to break up the concrete

TENNIS COURTS, GILLESPIE PARK, SARASOTA, FLA.
Adequate illumination is provided for evening use of the courts

Asphalt Tennis Courts for Public Parks

By W. E. Rosengarten

THE development of the park and playground idea by Federal, state, county, and municipal governments throughout the United States has led to an increased interest in the game of tennis, which furnishes one of the best outdoor exercises. In order that the game may be enjoyed by more players, many cities and other government subdivisions have been constructing in their park reservations batteries of courts, often of four to eight at a time. With the increased use there has been a tendency to improve the character of the surfacing. Gravel or turf courts are quite satisfactory, but when an especially good surface is desired, one of the asphaltic types is usually selected. The greater smoothness, firmness, and resiliency of these courts add much to the game. They permit fast and true play without serious fatigue or injurious effect upon the players. An asphalt tennis court surface is waterproof and is therefore available for play a few minutes after a rain. An important consideration from the standpoint of the park official is the ultimate economy, due to the fact that the courts can be kept in excellent condition throughout the playing season at little cost. The surface, being bound together and waterproofed with asphalt, will not erode or disintegrate, as is frequently the result of heavy downpours on sand-clay or earth courts.

Construction Methods

The outside dimensions of a double playing court are 36 x 78 feet. It is desirable to pave an area of about 60 x 120 feet, in order to afford ample room for play outside the lines.

The first step after selecting the location for the courts is to level the ground, and particular pains must be taken to make adequate provision for drainage. In sandy or gravelly soil this problem is not serious, as the water will drain away naturally. When clay predominates, the water will be retained and the underlying soil softened. A very satisfactory method of drainage is by constructing a ditch several feet deep along each side of the court. These ditches are sloped slightly toward the low ground. In the bottom is laid a line of small open-joint drain tile, and the trench is backfilled with broken stone to within a few inches of the surface. This will collect the ground water and lead it off. The surface water is drained off by giving a slight slope to the paved area.

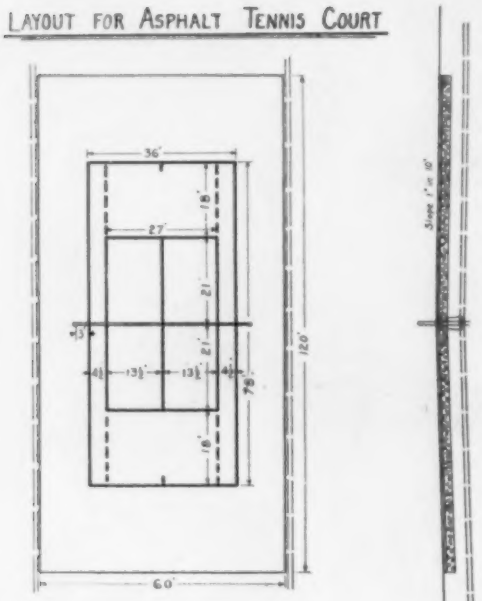
On the prepared and drained subgrade a foundation course of 4 to 6 inches of cinders, gravel, or broken stone is spread and thoroughly compacted by rolling. Too much stress cannot be laid upon the importance of thorough rolling, since it constitutes insurance against trouble later from the settlement of the paved area. An excellent base may be constructed with 3 to 4 inches of portland cement concrete or 2½ to 3 inches of asphaltic concrete, the latter a mixture of stone and sand bound firmly with asphalt cement.

Surface Treatment

Several types of asphaltic surfaces are satisfactory for tennis courts; the particular one selected being dependent upon the local materials and also the funds available for the work.

One of the smoothest and most desirable playing surfaces is the mixed asphalt type, similar to the paving on important thoroughfares such as Fifth Avenue, New York, or Pennsylvania Avenue, Washington, D. C. This is a mixture of

LAYOUT FOR ASPHALT TENNIS COURT



about 90 per cent of sand and stone dust with about 10 per cent of asphalt cement, usually referred to as "sheet asphalt." It is laid and compacted to a depth of 1 to 1½ inches. The materials are mixed hot. This can be done very conveniently at a municipal paving plant or by a local asphalt paving contractor. It is desirable that this surfacing be laid upon a so-called binder course of 1 inch thickness, composed of 70 per cent stone, 25 per cent sand, and 5 per cent asphalt cement. When the base course is of asphaltic concrete, the binder course is omitted, as the sheet asphalt surface will bind firmly to it. When a plant for preparing hot asphaltic mixtures is not available, a cold mix can be made with especially prepared asphalt cements known as emulsified asphalt and cutback asphalt. Satisfactory materials of this kind are on the market and can be mixed with unheated sand and stone to produce a surfacing mixture which will harden rapidly into a stable paving.

Another type of asphalt surface sometimes used is that constructed by the penetration method. Upon the prepared base course is spread a layer of 1½ to 2 inches of uniform-sized stone. This is dry-rolled and then over it is poured about 1/6-gallon of hot asphalt cement per square foot of area. This penetrates the course and binds the stone in place and is immediately covered with stone chips and rolled. In order to obtain a smoother surface, it is desirable to apply a second light application of asphalt and fine stone chips. This construction is somewhat less expensive than the mixed type previously described.

A less expensive surface can be prepared by simply treating a gravel or sand-clay court with an asphaltic oil, only about 0.03-gallon being required per square foot. This is covered with fine pea gravel or sand. It will be necessary to retreat the surface about once a year. After several treatments a more lasting surface will have been built up.

Sarasota's Experience

Asphalt paved tennis courts have been constructed in many localities throughout the United States and Canada. England has also made extensive use of these surfaces. The development of asphalt tennis courts at Sarasota, Fla., is of interest. The city has resurfaced three of its lime rock courts with 1½ inches of sheet asphalt. This is a hot mixture of sand and asphalt. The old lime rock courts were 4 inches in depth. J. R. Brumby, Jr., Commissioner of Public Works, reports that these have made splendid courts. A battery of four courts has also been constructed with sheet asphalt on a black base—an asphaltic concrete mixture of stone, sand, and asphalt cement. Four other courts were built with a 1½-inch sheet asphalt surface on a 4-inch base of oyster shells. Mr. Brumby states that these courts are electrically illuminated, and that play on them starts sometimes before the sun rises in the morning, and practically every night they are being played on until twelve o'clock. It is the most popular sport in that section. They also have a sheet asphalt volley-ball court that is very satisfactory. The players on these courts say that the resiliency of the asphalt makes them ideal.

Asphalt tennis courts are in service in the city parks of Atlanta, Ga.; Bridgeton, N. J.; Aberdeen, Wash.; South Bend, Ind., and Detroit.

Asphaltic surfaces similar to those described above have also been used for paving basket-ball courts, school yards, playgrounds, park walks, bowling-alleys, armory drill-floors, and building-floors.

EDITORIAL NOTE.—Additional details as to methods of construction and quantities of materials used can be obtained free by application to The Asphalt Association, 441 Lexington Avenue, New York.

What Shall Oak Park Do With Unclaimed Automobiles?

To the Editor of THE AMERICAN CITY:

The undersigned would appreciate any information from readers of THE AMERICAN CITY as to methods used by municipalities in disposing of unclaimed automobiles which may be found on the city streets.

This is getting to be quite a problem in Oak Park. Old cars are driven into the village and abandoned. All marks of identification are removed in some instances and the car is left on the street or in an alley. The Police Department is notified that it must be removed and it is brought to the village yard.

Other cars, which have been stolen, are abandoned in the village and sometimes quite a period of time elapses before they are claimed by the owners.

It is a question how to take care of these cars while in the possession of the village and how to finally dispose of them if not claimed. We are planning to pass an ordinance of some kind covering this and I should be interested to know how it has been handled in other places.

Yours very truly,
DUDLEY C. MEYERS,
Commissioner of Public Works.

Oak Park, Ill.

Two Tanks Used to Balance City Water Pressure

By R. E. Ludwig
Director of Public Utilities, St. Petersburg, Fla.

THE water-supply of St. Petersburg, Fla., at present, is obtained from twelve wells of two to three hundred feet in depth, drilled into the underlying limestone. The capacity of these wells varies from 600 to 1,200 gallons per minute each. Three additional wells are being drilled, one being practically ready for service, and the total capacity of all wells should then be around ten million gallons per day, if all are operated at one time. The practice followed, however, is to rotate the period of service for the various wells into equal periods and so to avoid as far as possible the consequent bad effects of over-pumping.

Electrically operated deep-well pumps are installed in each well and discharge into two common headers over aerators into two concrete reservoirs having capacities of 350,000 and 600,000 gallons respectively. The pumping-station contains six electrically operated centrifugal pumps, an emergency gasoline-engine-driven 139-kv.-amp. electric generator and two emergency pumps driven by a Sterling gasoline engine unit.

The three new 16-inch wells are in a new area, known as Crescent Lake Park, and are to be provided with electrically operated deep-well pumps which will discharge direct into a common 18-inch header, leading up through the standpipe of one of the new 500,000-gallon elevated tanks to an aerating system installed above the water-level, which is 140 feet above the tank foundation. A tank of similar size and construction is installed for storage and as a balancer, connected to the mains at a point over a mile from the above tank, giving a total storage of one million gallons.

The two new half-million-gallon water-storage tanks were made by the R. D. Cole Manufacturing Company, Newnan, Ga., for the city of St. Petersburg. The tanks themselves are 50 feet in diameter and approximately 40 feet deep, of the oval-bottom type, and are elevated on steel towers, so that their water-lines are 140 feet above the supporting foundations. The main riser pipes are 6 feet in diameter, and are surrounded by an ornamental spiral stairway, which provides access to a rather wide balcony, which can be used for observation purposes.

HALF-MILLION-GALLON ELEVATED STEEL TANK ERECTED AT ST. PETERSBURG, FLA.

The covers of these tanks are oval or dome-shaped in general outline and are provided with louvered ventilators. The ventilators are provided with Monel metal wire screens. The tanks are symmetrical in general outline and designed to fit nicely into the surroundings in which they are located. They represent the most modern practice in structural design. The final field coat of paint is aluminum, which enhances their general appearance.

The connection of these tanks to the main prevents the necessity of excessive pressure at the pumping-station, balances the line, and makes possible a more uniform and adequate supply on the existing mains.

A survey for a future water-supply is being made by Nicholas S. Hill, Jr., consulting engineer, New York. The extensions under consideration are the erection of a filtration and treatment plant with additional supplies from local lakes as well as other new wells.

How a County Planning Federation Is Functioning

By Wayne D. Heydecker
Secretary, Westchester County Planning Federation

TO Westchester County, New York, belongs the distinction of having been the first county in the United States to organize a County Planning Federation consisting wholly of the representatives of the municipal governments lying within the county and supported entirely by budget appropriations from such municipalities.

In December, 1925, at the suggestion of the Regional Plan of New York, the Mayors of Yonkers, Mount Vernon, New Rochelle, and White Plains and the Village President of Port Chester joined in the call for a meeting to consider common problems of planning and zoning. At that time zoning in the county was in a bad way, because of a number of decisions which can only be described as unfortunate from the standpoint of the zoning proponents. With the knowledge of these conditions, Edward M. Bassett, Counsel of the Regional Plan, in the principal address of the day analyzed the difficulties, suggested the correct procedure, and outlined some legislative enactments which he believed to be necessary for the proper handling of the planning and zoning situation encountered.

At that meeting, attended by fifty-four delegates representing twenty-two municipalities, two committees were appointed. The first, headed by William Cravath White, Village Attorney of Scarsdale, was charged with the responsibility of drafting and urging upon the Legislature the legislative enactments suggested by Mr. Bassett in his talk. The other committee, headed by the presiding officer, Mayor Frederick C. McLaughlin of White Plains, was charged with the responsibility of working out a form of organization for the municipalities, providing a clearing-house for information, and affording an opportunity for the exchange of experience.

Mr. White's committee labored during the winter and produced three bills, two of which were passed by the Legislative Session of 1926 and signed by the Governor as Chapters 690 and 719 of the Laws of 1926. These related respectively to the cities and villages and conferred upon them power described in THE AMERICAN CITY for June, 1926 (see page 671). The companion bill, conferring the same power on town governments, failed of passage in 1926, but was adopted this year and signed by the Governor as Chapter 175 of the Laws of 1927.* Thus, while the Westchester County Planning Federation was in process of formation, it achieved its entire legislative program and secured the adoption of three amendments to the city, village, and town laws which have been heralded as far-reaching achievements.

Sectional Form of Organization with Membership Vested in Municipalities

In the meantime, Mayor McLaughlin's committee had worked out a form of organization in which each municipality, regardless of size, had one vote. The county, moreover, was divided into four sections in which certain common interests were apparent. The Hudson Section consists of the communities lying north of the New York City line, beginning with Yonkers and running to North Tarrytown; the Bronx Valley Section begins with Mount Vernon and runs north to White Plains; the Sound Section begins with the Pelhams and New Rochelle and runs along the Sound northeast to Port Chester; the northerly section of the county in which the Croton watershed is located is known as the Lake Section, and its problems are entirely distinct from those of the other three sections lying in the southern part of the county.

Membership is vested in the municipalities themselves, each member municipality being represented in the Federation by its chief executive, the members of the Planning Board or Commission, if any, and such other persons as the Common Council or the Village or Town Boards may designate. To these there have been added recently the heads of the legal and engineering departments and the membership of the local Zoning Boards of Appeal. Directors are apportioned among the sections largely according to population, each city being entitled to one director and the villages and towns in the section voting for the remaining directors. Dues are apportioned according to population: cities, uniformly $250 per year; villages and towns over 10,000 population, $150; villages

*See THE AMERICAN CITY for April, 1927, page 530. See also article by Professor William L. Bailey, of Northwestern University, on "Regional Planning Makes Suburban Federations Imperative," March, 1926, pages 257-260.

and towns under 10,000 and over 3,000 population, $100; villages and towns under 3,000 population, $50.

Thus far, all four of the cities and eight of the villages in the county have cooperated and pledged their financial support, and it is expected that many of the remaining villages will shortly join the Federation.

The budget at the present time is a modest one—$1,850 for the first year, but the significant thing is that the money has been appropriated by the village and city authorities as a definite pledge of their cooperation toward the solution of their common problems. The Federation is particularly fortunate in having as its President and Vice-President, respectively, Mayor William A. Walsh of Yonkers and Mayor Frederick C. McLaughlin of White Plains, both dominant factors in municipal affairs within the county and both keenly interested in planning problems. Earl B. Wilson, a member of the Village Planning Board of Tuckahoe, is the Treasurer, and Wayne D. Heydecker, Field Secretary of the Regional Plan of New York and Chairman of the Planning Board of the City of Mount Vernon, is the Secretary.

Building a Program of Work

It is planned to hold a series of meetings to discuss the problems that are uppermost in the minds of the planning authorities of the municipalities. To determine what those subjects are and what subjects should be taken up for special legislative treatment, representatives of the various communities are being asked to make their suggestions as to the Federation's Program of Work, which will be developed just as similar programs are developed for chambers of commerce and other bodies.

"Community planning is the practical arrangement of the pattern of streets, parks, railways, and other physical features, and the regulation of the use of land so as to secure maximum efficiency for business and industry, and maximum comfort and health for the residents.

"Whatever beauty arises from community planning results from doing well what needs to be done. The goal should be community efficiency. Ugliness and waste are enemies of efficiency. Hence most community planning tends to beautify, but this by-product must not be confused with the main purpose, which is to make communities more convenient, healthful, and efficient places in which to live and make a living.

"Your community as it grows is going to spend large sums of public money for improvements, whether you have a plan or not. If it grows without a plan, you *may* get a fair return on the money spent. The chances are you will not. Since the money is going to be spent, anyhow, why not spend it according to a definite plan? The County Planning Federation cannot provide you with technical advice, but it can help you by gathering facts that will enable you to determine what course is best for your community until you can develop a plan and a public improvement budget. Moreover, by working with neighboring communities that share common problems with you, you can benefit by the interchange of experience in the meetings which the Federation will arrange.

"The first step toward the solution of any problem is to define it. What are the phases of planning that appear to need first attention in your community? Write them down on the accompanying blank and mail them to the Secretary. From them will be compiled a program for the Federation, so that the topics of public meetings and research studies will deal with the subjects on which you have need of information."

Is the Efficiency of Your Community Handicapped by—

1. Lack of real street plan?
2. Streets laid out without regard to grades?
3. Too narrow thoroughfares?
4. Lack of highways to by-pass through traffic?
5. Great congestion of the streets in your shopping center?
6. Inadequate highway approaches to the center?
7. Too narrow sidewalks or too many sidewalk obstructions?
8. Dead-end streets?
9. Wastefully wide streets in residential areas?
10. Lack of street connections in new subdivisions?
11. Grade crossings?
12. Lack of bridges?
13. A parking problem in the business center?
14. An inadequate or unsafe water-supply?
15. An outgrown sewer system?
16. The encroachment of business and residence structures upon land that should be reserved for industrial development?
17. The invasion of a business or residence district by industry?
18. Inadequate or wrongly located public buildings?
19. Lack of wholesale market facilities adjacent to good transportation?
20. Lack of suitable apartment districts?
21. Lack of protection to one-family home owners?
22. Lack of suitably located neighborhood business centers?
23. Lack of playground and park areas?
24. A scattering of business properties with resultant failure to obtain the benefits of a concentrated but not congested business area?
25. Lack of a budget plan for financing public improvements?

FROM THE QUESTIONNAIRE OF THE WESTCHESTER COUNTY PLANNING FEDERATION

Forward Steps

Reported by Municipal Officials, Chamber of Commerce Executives and Others

City Manager Plan Wins Decisive Victory in Austin

AUSTIN, TEXAS.—Although a majority of the voters of Austin tentatively expressed a desire to adopt the city manager plan of municipal government as far back as August, 1924, it was not until the election of April 4, 1927, that friends of the system considered their victory conclusive.

The recent election, which by a vote of almost three to one retained in office a City Council which had operated under the city manager plan for about eight months, ended a fight which had been waged by the old order against the new for nearly three years. When a new charter was approved at the polls in August, 1924, calling for an election to vote on the city manager proposition, the old administration contested the charter election and fought through the courts for over two years, until finally defeated. An election was then held, on May 11, 1926, and five new Councilmen pledged to the city manager plan took office July 1, following. All are prominent in the business and professional world and serve without compensation.

At the time the new Council took hold, the city's finances were in such condition that it was found difficult to employ a qualified city manager, so a business man of Austin, Adam R. Johnson, was virtually drafted to take the job at $10,000 a year, although outsiders had refused to accept the post at a larger salary. Mr. Johnson agreed to serve temporarily.

After eight months, with the time for the regular election approaching, two members of the old Council and others allied with them decided to oppose the present Council, centering their attacks upon the City Manager as an individual. The fear was expressed by friends of the new order that once the "old crowd" got back into office some way would be devised to return to the old system.

On March 14 last, Dr. C. W. Goddard, City Health Officer, walked into the office of City Manager Johnson and shot him several times with a revolver, a few hours later ending his own life in jail with a small pocket-knife. The City Manager recovered from his wounds. Dr. Goddard had learned that he was about to be replaced in his office, and blamed the City Manager, although members of the Council denied that Mr. Johnson had recommended the Health Officer's dismissal. While this tragedy had no direct connection with the campaign at that time, it figured to some extent later.

The administration defended not only the city manager plan, but the City Manager himself, showing that the new officials had assumed office confronted with an overdraft of $66,000, with about $5,000 being paid out annually in interest, and that in eight months' time they had wiped out the deficit and the city was receiving $40,000 in interest on the balance on hand. It was shown that the old practice of employing outside attorneys to collect delinquent taxes had been abolished, and the duty left in the hands of the City Attorney. This resulted in a saving of $12,500 in less than twelve months or considerably more than enough to pay the City Manager's salary for a year. The improved financial conditions enabled the city to sell $150,000 in school bonds at par and accrued interest, besides a substantial premium, without raising taxes one cent. The light and power rates have been reduced so that the smaller users save 30 per cent on their light bills, or a total average reduction of 12 per cent, although there was a deficit in the Water and Light Department when the new Council took charge.

The situation at this time is that the City Manager is to remain at his post; that a bond issue of $2,000,000 for streets and sewers is in prospect; and that a municipal auditorium is being considered, as well as a number of improvements relating to schools and hospitals.

Most important of all, however, is the fact that a political issue has been disposed of that will permit the city to progress more rapidly since leaders of the old order have bowed to the will of the voters and have pledged cooperation.

THOMAS E. KELLY.

Measuring the Efficiency of a City's Government by the Munro Criteria

DALLAS, TEXAS.—A few months ago the author undertook to survey the city government of Dallas in terms of the criteria formulated by Dr. William B. Munro, Professor of Municipal Government in Harvard University. These criteria are contained in his book on "The Government of American Cities" (fourth edition, 1926), and were reprinted from that book in THE AMERICAN CITY for November, 1926, by permission of The Macmillan Company.

The results of this survey were embodied in a series of fifteen articles which appeared in the *Dallas News*. The articles have now been reprinted in pamphlet form in the hope that those who are interested in improving the government of other cities may be encouraged to undertake and publish similar surveys for the information of their own people.

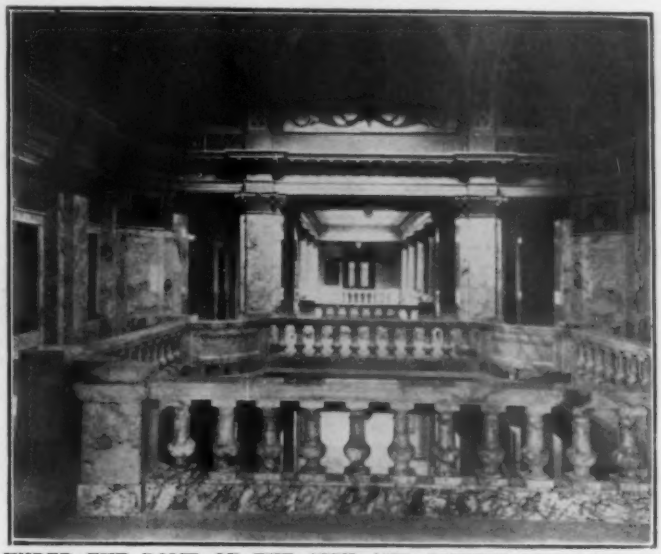
While Dallas makes a showing of only 56 per cent under the tests that have been applied, the author believes its municipal government to be above the average, taking American cities as a whole.

The first effect of the publication of this series of articles in Dallas was the inclusion in the platforms of the two principal organizations of the city contesting for the offices of mayor and commissioners in the April 19 election, of planks pledging the submission of charter amendments author-

izing the city-manager form of government, such submission to be within two years from May 1. We are now in process of organizing a Citizen Committee which will handle the details of the campaign in support of the city manager plan and through which it may be possible to secure an early submission of the question.

The *Dallas News* has long taken an active interest in civic and governmental affairs of the city and state. It led the movement which resulted in the Kessler city plan for Dallas and its environs, a great deal of which has been executed and for the completion of which proposals for a bond issue of between $35,000,000 and $40,000,000 are being formulated by a Citizens' Committee for submission to the voters this fall.

LOUIS P. HEAD.



UNDER THE DOME OF THE CITY AND COUNTY BUILDING IN PROVO

A New City and County Building of Architectural Beauty

PROVO, UTAH.—About seven years was required to build the new city and county building at Provo, Utah, which houses the offices of the city administration of Provo and of the officials of Utah County. The perfection of the completed structure, however, shows that these years of painstaking construction were well spent.

When the City and County Commission, acting jointly, decided to construct a new building, a committee was designated to tour the Pacific Coast and study all types of buildings. The trip took the committee from Los Angeles on the south to Everett, Wash., on the north.

The new building, of which Joseph Nelson, of Provo, is the architect, is more than a public office building; it is a work of art, a monument to the people who erected it, and a rival in grandeur of some state capitols. In design it follows Greek architecture, but it is not a copy of any other structure. The total cost of construction was $576,495.

The ground floor has been treated as a pedestal bearing the upper stories. Around the rim of the building is a classic balustrade. The column caps and cornice are adaptations from the Temple of Minerva. The center pavilion is brought forward and surmounted with a pediment backed by an ample attic, which permits an interior dome effect. The space beneath the central dome has been assigned as a space for a permanent art gallery, to be managed by the artists' league of the county.

The portico is two stories high and consists of six columns, each 3 feet in diameter and 25 feet high. The outer pillars are paired. Inside the portico is the main entrance, of marble wainscot with marble pilasters and Ionic caps. This entrance, and the windows under the portico, are elaborated with sculpturings. On the face of the pediment is a group carving depicting the purpose of the building and symbolizing the assets of the city of Provo and Utah County.

NEW CITY AND COUNTY BUILDING, PROVO, UTAH

An unusual treatment has been given the interior of the building. By the installation of contact windows opening onto the central corridors, through which people are able to transact most of their business, it has been possible to conserve the amount of space devoted to offices. This allows for more open corridors than are usually found in buildings of this size. Running through the two main floors is a nave, the lower corridor designed in modern Ionic style and the upper in modified Rennaissance.

To commemorate the dedication of this structure, an illustrated souvenir booklet was issued. This contains a number of excellent views of the exterior and interior of the building, as well as a brief history of the project and many interesting construction details. Two of the views from this booklet are reproduced herewith.

O. A. FITZGERALD.

Americanization and Beautification in Canton

CANTON, OHIO.—Through its Americanization committee, the Canton Chamber of Commerce recently welcomed more than a hundred foreign-born men and women into United States citizenship. The occasion was the granting by the Court of certificates of citizenship to these foreign-born Cantonians.

The ceremonies arranged by the committee included an address by the City Solicitor of Canton, a message of welcome by the committee chairman, music by a ladies' quartet, a talk by the presiding judge, and a humorous monolog by one of the new citizens. Each new citizen was presented with a small silk flag and a copy of the Constitution of the United States. The program was a complete success throughout.

A city-wide home beautification contest for the improvement of front lawns is being staged this summer under direction of the City Beautiful Committee of the Canton Chamber of Commerce. All residents of the city are eligible to enter. Prizes include $200 in cash, $50 worth of shrubbery, and one hundred beautiful rose-bushes.

The City Beautiful Committee is composed of a group of more than twenty men and women. It is their plan to extend the contest next year to include gardens. The contest regulations are such that a small lawn has as much chance of winning a prize as a large one. The city is divided into four sections, with separate awards in each. Data concerning the contest and its rules can be secured by writing to the Canton Chamber.

DALLAS L. HOSTETLER,
Assistant Manager.

Rockland Furthers City Planning and Zoning in Maine

ROCKLAND, ME.—On April 15 an act creating a City Planning Board for the city of Rockland and an act amending the zoning law to permit any city, town, or village corporation in the state to adopt a zoning ordinance, were signed by Governor Brewster. To the Rockland Chamber of Commerce and the other local organizations which have been active in promoting this legislation, the final passage of the acts was particularly gratifying.

The City Planning Board bill was prepared by a Committee made up of representatives of the City Council of Rockland, the Service Clubs, and the Chamber of Commerce. This bill has been very favorably received by our citizens, who are looking forward to the results that will accrue from the appointment of such a board. The Board will consist of three members, to be appointed by the Mayor, with the City Engineer serving as Chief Engineer of the Board.

As a result primarily of the local discussion on city planning, Mayor James F. Carver of Rockland brought up the matter of zoning before the Conference of Mayors recently held by the mayors of this state. The outcome of his action was the appointment by the Conference of a Committee of Mayors, which drew up the amendment providing for the adoption of a zoning ordinance by any municipality in the state. Previously, zoning had been limited to village corporations and cities of over 35,000 population.

SAMUEL S. LORD,
Executive Secretary, Rockland Chamber of Commerce.

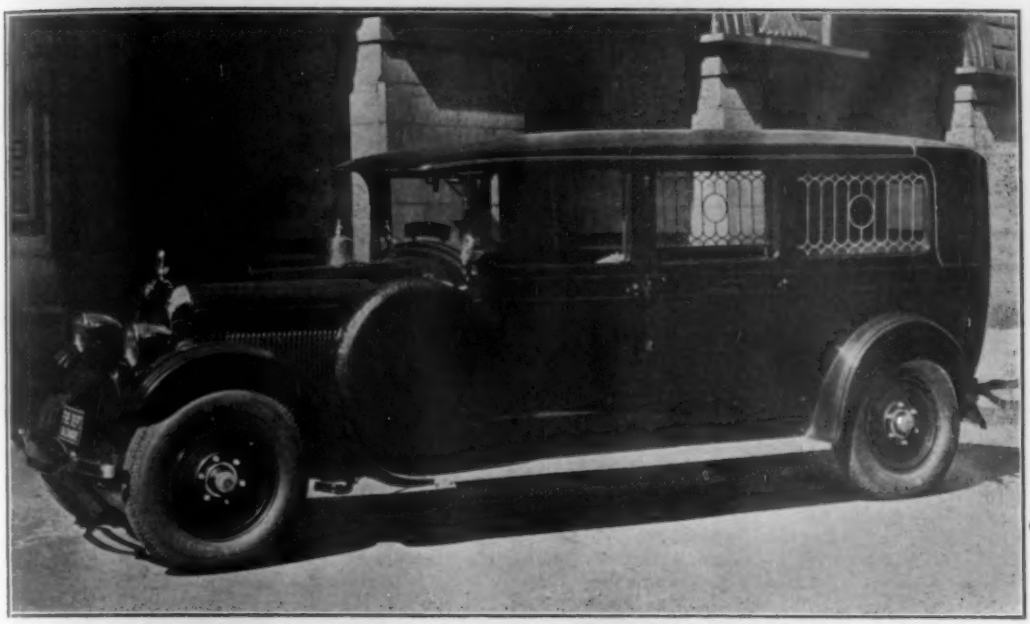
Fire Department Acquires New Ambulance and Automobile Electric Plant

BALTIMORE, MD.—The Fire Department of this city has just added to its equipment two new units that represent the latest developments in its field of work. One is an ambulance which replaces a vehicle that is no longer up to date; the other is an electric plant carried on an automobile and supplying floodlights for use on the outside and also in the interior of a burning building.

The ambulance, a Studebaker, has balloon tires and is designed for easy riding. It is painted the standard fire department red, with nickel trimmings, and has the exhaust whistle allowed only on fire department equipment, in addition to the bell. The portion back of the driver has two side doors and a rear door, and accommodates a stretcher-bed, two seats, and a complete surgical cabinet. The bed and seats can be removed and several men carried on the floor, if necessary; and by setting up the bed elsewhere as an operating table, along with a portable surgical cabinet, two centers of aid at the fire ground are provided by the same ambulance. Two ordinary stretchers are also carried, slung in waterproof covers under the running-boards. The running-board also carries the latest type of oxygen Inhalator for resuscitation, made by the Mine Safety Appliance Company of Pittsburgh. It embodies provision against over-dilation of the lungs.

Each of the drivers has been specially trained as a first-aid orderly; and the firemen assigned as aides to the doctors are important factors in the surgical end of the department's service, and take pride in their work. The ambulance is centrally housed, and answers all second alarms, and a doctor meets it on the fire ground.

The floodlight truck provides an improved kind of lighting to supersede the calcium lights and so-called water-lights heretofore used, and makes the firemen independent of electric lighting systems in burning buildings. The truck carries a gasoline engine separate from its own driving motor, that is used at the scene of action to drive an electric generator on the truck body and thus supply a series of floodlights. Both the interior and the exterior of the building can be illuminated, and the roof can be lighted up from higher nearby structures. The type of generator is the Kohler Automatic and comprises the following features: four-cylinder, 1,000 r.p.m., operating on gasoline and starting au-



THE FIRE DEPARTMENT OF BALTIMORE MAINTAINS THIS UP-TO-DATE AMBULANCE

tomatically when first light is turned on; mechanical governor; fuel supply from main tank; four-pole generator, direct current, 110-volt, 1,500 watts. The cable from the generator to the lights is not only water-proof but is protected against damage from heavy vehicles that may pass over it.

Two Inhalators of the same type as on the ambulance have been placed on the wagon of No. 1 Engine Company, which also answers all second greater alarms.

AUGUST EMRICH,
Chief of Fire Department.

INTERIOR OF BALTIMORE'S FIRE DEPARTMENT AMBULANCE

Newspaper Organizes Successful Campaign for Street Safety

ATTLEBORO, MASS.—This city, with its 25,000 or more inhabitants, presents a striking example of what can be accomplished in the way of producing safe streets when public opinion is aroused.

For years past, in common with other cities and towns in this commonwealth, the number of highway accidents involving injuries to persons and property has been gradually increasing. No special notice was taken of it. Automobiles would collide at street corners. Careless pedestrians would be struck while attempting to cross the streets. Accidents in which children were involved were of common occurrence. Most people were accepting this condition as one of the things that could not be helped.

On November 5 last *The Attleboro Sun* started a safety campaign. It called attention to the many accidents that were occurring. It insisted that, if the people could be aroused to the danger that lurked at every corner, these accidents could in a large measure be stopped. A search was made into the records at the police station, and among other things it was learned that, from June 1 to November 1, 37 children under 14 years of age had been injured by automobiles in Attleboro badly enough to require the services of a physician. How many other accidents had occurred during the same period of time was not learned. They were too common to cause special attention.

A great mass meeting of the children of the public schools was called in a local theater. The Mayor, the Chief of Police, other city officials and a representative from the state automobile department made short and forceful speeches. A member of the *Sun* staff was empowered by the school department to organize branches of the Junior Safety Council in every grade school of the city, and within a little more than a week this was done.

In the meantime every edition of the *Sun* car-

ried stories of what was being done and of the necessity for the support of various organizations to help in this work. Then a Highway Safety Club was formed, made up of several hundred automobile drivers, with one of the leading business men of the city at its head.

All these various agencies have functioned ever since. The schools are doing their part. The drivers are really using more care, and here are the concrete results:

Since November 5, 1926, to the present date (April 7, 1927) only one person has been seriously injured by being struck by an automobile in the city. The police reports show that the number of accidents of all kinds in which automobiles have been involved has been reduced at least 75 per cent, and, best of all, not one single child under 14 years of age has been injured by an automobile in five full months within the limits of the city of Attleboro.

The safety campaign has been a success, and is going to be continued. The *Sun* is not letting up; frequent warnings are found in its columns. The people are responding; the police are doing their part; school officials are giving constant help; and the parents of the children have apparently wakened to the fact that on their shoulders rests a great deal of the responsibility.

R. CLYDE L'AMOUREUX.

Chambers of Commerce Unite in Campaign to Finance Important Toll-Bridge

NEWPORT, R. I.—By mustering the help of a committee of one hundred, called the Mount Hope Bridge Committee of Southern Rhode Island and made up of representative citizens of twelve towns and cities, who were not only signed to work but to subscribe financial aid, the Newport Chamber of Commerce has achieved a real triumph in the passage of the Mount Hope Bridge Act authorizing the construction of a high-level bridge over Mount Hope Bay. This bridge will connect the cities of Newport and Providence by a direct highway within the state of Rhode Island, the present highway connection being a roundabout route by way of Fall River, Mass.

The act, as passed, authorizes the Mount Hope Bridge Company to build the bridge at an estimated cost of $5,000,000. It will be a toll-bridge, with the toll charges under the control of the State Public Utilities Commission. The state is given the option of buying the bridge at the end of each ten-year period following its opening, at a price specified in the act, and the bridge becomes the property of the state, without charge, at the end of forty years if not purchased prior to that time. The estimated traffic, paying a maximum toll of 50 cents per vehicle, is expected to yield a gross return of 9 per cent on the total cost, according to the reports of the engineers who made the preliminary survey. The company is permitted to earn 9 per cent during the first ten years, and 8 per cent thereafter, on the original cost plus subsequent additions to the property. The company is required to file a bond of $500,000 with the state, guaranteeing the satisfactory completion of the bridge by July 1, 1931.

Every chamber of commerce in the state lined up 100 per cent, and many luncheon clubs, and the granges and labor organizations also, gave their endorsements. A special feature of the campaign was the entertainment at a banquet of the Governor and all the members of the General Assembly, at which time the matter was discussed and explained by competent bridge engineers.

A survey of the possibilities of travel and earnings was made by the engineering firm of Ford, Bacon and Davis of New York City. This survey proved to be the convincing argument to the General Assembly, the Finance Commission, and the Governor.

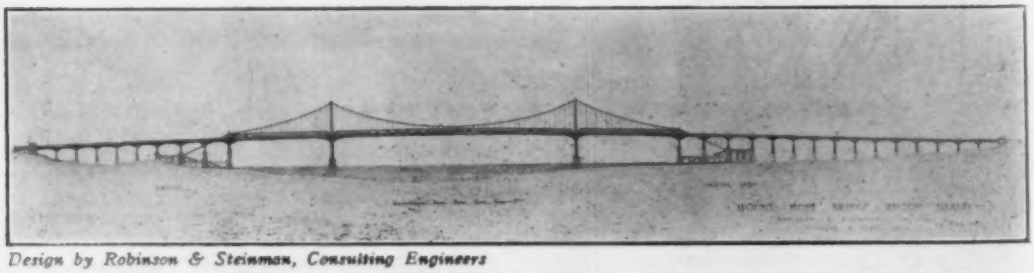
The Mount Hope Bridge will be a new link in the New York, Newport and Cape Cod Highway, and it is anticipated that thousands of tourists and visitors to New England will take advantage of the short route and enjoy from it an unusual view of Narraganset Bay and the surrounding country. The bridge will be 140 feet above high water and, including the approaches, approximately one mile in length. It will have the longest center span of any bridge yet built in the United States.

W. C. CAMPBELL,
Managing Secretary, Newport Chamber of Commerce.

Yellow Instead of Red for Fire-Plugs

CINCINNATI, OHIO.—A change has been made from the proverbial red which has been used as the color for fire-plugs in this city. This year they are being painted yellow, by firemen detailed from the engine-houses in each locality. Yellow is also used to some extent in the painting of fire-alarm boxes. The boxes themselves are still painted the standard red, but in the case of those which are mounted on pedestals, the top of the latter, just below the box, is painted yellow; and with those mounted on telephone poles a yellow band is painted both above and below a broad red band around the pole at the box itself. The yellow is used in order that the attention of the public may be more readily attracted to the location of the box.

C. S. JONES,
Superintendent, Fire Alarm Signal Corps.



Design by Robinson & Steinman, Consulting Engineers

THE PROPOSED MOUNT HOPE BAY BRIDGE, TO CONNECT NEWPORT AND PROVIDENCE

Items and Ideas

Sensational Newspapers Help Create Crime Conditions

THE "yellow press" is given prime importance among causes of present crime conditions in this country by Professor Raymond Moley, of Columbia University, who declares that one of the chief failures of the criminal courts is due to the "insidious trial of cases" in the newspapers, done with a bias of trying to build circulation.

This eminent social scientist, who was, until March 1, advisor of the New York State Crime Commission which sponsored the Baumes laws, in a discussion of crime conditions recently before the Clergy Club of New York, criticized the drives for more drastic penalties as provided in those laws. These, he sees as not only imperiling unduly the lives of police and prison wardens, but as being altogether less effectual than a consistent policy of more and milder convictions.

Particularizing his charges against the "yellow press" in fostering crime, Professor Moley specified the "insidious influence of possible publicity" not only upon criminals, but also upon public officials, and added that "judges seemed unable to withstand the influence of this part of the press." He alluded to a famous New Jersey murder case, where the case itself was tried by a sensational New York daily, and where some portions of the evidence were not in the custody of the court, but of the newspaper. He characterized the portrayal of famous lawsuits by composite photographs and drawings, as is commonly practiced by some of the dailies, as "outraging the laws of decency."

Among other sources of crime enumerated, are: "a general condition of incompetent police work throughout the United States, inexperienced prosecutors pitted against legal veterans defending criminals, public parsimony toward expenditure for an efficient penal system, and publicity-seeking judges."

But in spite of the failure of police and prosecutors, in spite of the inadequacies of our penal system, and the perversion of the "yellow press"; in spite of assertions which he makes to the effect that we have not yet begun to grasp the essentials of crime prevention, Professor Moley denies conclusive evidence of a crime wave. He sees us rather caught in a storm of statistics, biased perhaps by propaganda, that tell us of crime waves.

Drivers of City-owned Automobiles Required to Obey Traffic Laws

THE habit of disregarding traffic regulations, which is indulged in by city employees in many places because they happen to be driving city-owned cars, has received a setback in New York in the form of the following letter from Joseph A. Warren, the recently appointed Police Commissioner, to the heads of all city departments:

"My attention has been drawn to the fact that many of the city cars do not observe the right of way, speed and stop regulations in connection with traffic. Chapter 24, Article 2, Sections 15 and 17 of the Code of Ordinances provides in effect that all city vehicles observe the law and the various rules and regulations, except vehicles of the Fire, Police, Water-Supply, Gas and Electricity Departments and the Bureau of Public Buildings, as well as ambulances. Even the vehicles of these departments may disregard the same only in the case of fire, accident, public disaster or impending danger.

"The disregard of these provisions of the law not only increases the inconveniences of traffic in the city but constitutes a real danger to life, especially in the case of pedestrians. The pedestrian, when he sees the light turned against traffic, has the right to walk across the street, assuming that no traffic will pass, and it is perfectly obvious that if this rule is disregarded, some day or other a serious accident is bound to occur.

"I am writing this letter to you and the other heads of departments and bureaus asking cooperation with this department by ordering those in your employ who ride in motor vehicles to comply with the law. I feel confident of your assistance. I may say this letter is written not only with the approval but at the suggestion of the Mayor of the city of New York."

Residents of Large Cities Becoming a Race of Cliff-Dwellers

LAST year, for the first time in the United States, the record of building permits compiled by the Department of Labor (for cities of over 25,000 population) shows that the number of new family accommodations provided during the year was greater in apartment houses than in new single-family dwellings. This fact is emphasized by the Bureau of Labor Statistics in a statement regarding a six-year comparison of such permits, soon to be published in bulletin form. An extended summary of the report appears in the May *Monthly Labor Review.*

This summary shows that for the 257 cities of over 25,000 population for which statistics are available for 1921 to 1926 inclusive, the percentage of building permits granted for different types of dwellings has varied as follows:

PER CENT OF FAMILIES PROVIDED FOR IN

	New 1-Family Dwellings	New 2-Family Dwellings*	New Multi-Family Dwellings†
	%	%	%
1921	58.3	17.3	24.4
1922	47.5	21.3	31.2
1923	45.8	21.2	33.0
1924	47.6	21.5	30.9
1925	46.0	17.5	36.4
1926	40.7	13.9	45.4

* Includes also one-family and two-family dwellings with stores combined.

† Includes also multi-family dwellings with stores combined.

In a statement announcing this forthcoming report, the Bureau of Labor Statistics says:

"The total number of families provided for in these 257 cities in all classes of dwellings during

1926 was 462,114. This is a reduction of 6 per cent as compared with 1925, the peak year, but is the second highest number shown in the six-year period, and is more than twice as many housing units as were provided in 1921.

"The figures in the above table would tend to show that we are becoming a race of cliff-dwellers, for in the year 1926 accommodations were provided in apartment houses for 209,742 families, or 45.4 per cent of all families provided for during that year, while one-family dwellings provided for only 188,074, or but 40.7 per cent of all families provided for. This is the first year that apartment houses have provided more new family accommodations than have one-family dwellings.

"Compared with 1921, there has been an increase of 105.8 per cent in the number of families provided for in all classes of dwellings. During this same period, however, the number of families accommodated in apartment houses increased 282.6 per cent, while the number provided for in one-family dwellings increased only 43.7 per cent. The number of family units provided for by two-family dwellings increased 65.5 per cent over the six-year period."

County Health Board Now a Recognized Necessity

TWO-THIRDS of the United States—thirty-two states, to be specific—now have definite legal provisions for county boards of health. Eighty-five per cent of the states, either with or without legal sanction, have such boards, or have, at least, county health officers who in most cases act as members of some sort of county-wide health units.

This information has been made available through a national survey recently made by Dr. James Wallace, Deputy Commissioner of the State Department of Public Health of Iowa. A tabulated summary of the results of the survey is published in *The Nation's Health* for March, with comment on specific legislation and organization in the various states, and some discussion of local county activities in the exceptional states.

Dr. Wallace's conclusion, based on the results of the survey, is that there now exists a general recognition of the advantages of county health boards, not only to the counties themselves but to the states as well. Some of the reasons he gives as follows:

"The present political unit for health work in some states, the township, village, or municipality, no longer represents an isolated or demarcated area. . . . Distance no longer affords the protection it once did, because we now know that diseases are not air-borne but people-borne, and people in the country now find it easy to come twenty miles to a party in 'the amusement hall at the corners.'

"Problems affecting health often arise that should be of concern to contiguous or adjoining counties. In county boards of health the machinery exists for consultation and action on measures that may be of mutual benefit to two or more counties."

Among other reasons for the widespread organization of county health boards, Dr. Wallace mentions the township or village health official who is at a loss as to how to act when an emergency arises, contrasting him with county officials whose business it is to have made a study of conditions and to have prepared themselves for meeting unexpected situations, and whose further business it is to provide machinery through which county-wide health projects of constructive nature may be launched and promoted for the public benefit.

Official Reports Show 10,123 Playing Places in 790 American Cities

NEARLY twenty million dollars was expended in the United States last year on organized programs of public recreation. These programs were carried out by 17,090 salaried workers, who had the assistance of 8,625 workers serving without pay. But impressive as the statements sound, they are not the complete story of America's recreational progress during 1926. The report from which they are taken in the Year Book number (April) of *The Playground*, shows them to be based upon figures from the 790 cities reporting officially to the Playground and Recreation Association of America and shows further that approximately 320 cities of over 8,000 population are unrepresented.

Detailed expenditures of the $19,202,123.25 play budget are shown in a series of tabulations included in the Year Book, with subdivisions by cities and states. In the cities covered by the report 10,123 separate playing areas are indicated, 732 of them having been opened in 1926; and the following interesting details are given concerning especially developed play places in these 790 cities:

Indoor recreation centers	1,764
Ball fields	2 972
Tennis courts	6,254
Swimming pools	693
Bathing beaches	276
Summer camps under recreation systems	184
Municipal golf courses	194
Skating places	1,506

In 32 cities, land or other property was dedicated to public recreation purposes during the year.

National School Plans for Most Successful Session

WHEN the National School for Commercial and Trade Organization Executives meets for its seventh annual session at Northwestern University on August 22, it will offer two new seminar courses for postgraduate students. One will deal with city planning, and the other will set forth possible ways in which city congestion may be obviated by the adoption of advance measures. The appearance of these courses in the curriculum of the school indicates the growing importance of city planning and recognition of the widespread problems of street congestion which has resulted from the building of skyscrapers and multi-family dwellings and the general use of automobiles.

There will be three types of courses on the regular program. In the first type are included courses that are designed to help the student to keep in touch with the constantly changing views on present-day economic, political, community and business conditions and problems. These include such subjects as public finance and taxation, marketing and distribution, legislation, the industrial development of the United States, accounting and financial analysis, psychology and effectiveness in letter writing, composition and speaking.

The second type covers the general technique and daily activities of commercial and trade associations. These courses include office administration,

committee work, the building of membership, the organization of secretarial work so as to yield the greatest results, and the like. The third type deals intensively with special kinds of activity undertaken by many organizations but not featured by all, such as industrial research and development, retail trade development, credit bureaus, conventions, street and highway traffic, solicitations and community chests in social work, and public health activities. Specialized courses are also provided for trade association secretaries.

The attendance at the School last year was 240, and it is expected that this will be appreciably increased during the coming session.

The sessions of the School this year will occupy two weeks, as usual, from August 22 to September 3. The School is not a profit-making institution, the tuition fee being only $30 for the two weeks, or $20 for one week. Fine accommodations are provided by Northwestern University at low rates. Additional information regarding the School may be obtained from John N. Van der Vries, Secretary, 134 North La Salle Street, Chicago. Hugh Lynch, of The Merchants' Association of New York, is Chairman of the Attendance Committee.

Complete Calamity Program Outlined by Ordinance

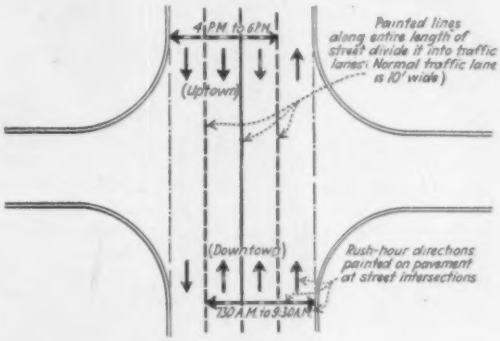
PREPAREDNESS, frequently adopted as a slogan or as an informal public policy, has become law in Berkeley, Calif., a city more than once in the past visited by major catastrophes and therefore resolved never again to be caught unawares in any emergency. A recently passed ordinance there provides for a program of complete disaster activities for the administration of which the municipality and the local chapter of the American Red Cross are given joint responsibility. This program is a practical one based upon joint studies made by the city and the Red Cross since Berkeley's disastrous fire of 1923. It makes provision for two distinct divisions of emergency relief, both to become instantly effective when occasion arises.

Any emergency is to be determined and declared by the city manager, who will first notify the Red Cross. The public, including the students of the University of California, will then be notified by a prearranged signal of siren blasts that will simultaneously summon city employees to report at the City Hall, which will serve as emergency headquarters. Protection of life and preservation of order under this ordinance are governmental responsibilities, while emergency relief and all rehabilitation activities are Red Cross functions. The city government is empowered to commandeer municipal motor equipment and such other publicly owned property as is needed; and to call upon fire and police departments of other San Francisco Bay cities, the R.O.T.C. of the University, National Guard troops, Army and Navy commanding officers, the American Legion and V.F.W., and nurses and physicians of the State Board of Health.

Eleven departments of municipal disaster relief are designated, their functions outlined, and personnel for their administration indicated. Eight Red Cross subcommittees are similarly prescribed. The detail planning which has been done on the framing of these committees may be judged by the duties allotted to the eighth or final Red Cross group, the subcommittee on business coordination and publicity, headed by the Managing Director of the Chamber of Commerce. It is charged with responsibility for assembling prompt and accurate disaster information for press release; for establishing a commuters' bulletin service on the San Francisco side of the ferry line; for coordination of relief efforts of business men; and, finally, for investigating complaints, controversies and damage claims, and bringing these to proper authorities for attention. The Boy Scouts of the city will provide messenger service outside the danger zones, acting under police or military direction.

Full Use of Street Width During Rush Hours—Most of It for Heavy Travel

SEVERAL cities are making full use of the traffic capacity of certain streets during rush hours, by reversing traffic on central lanes. The basic remedy for relieving congestion and speeding up traffic—street widening—takes time and money. Preceding and during such changes, immediate relief, at a minimum of cost, can be


4 P.M. to 6 P.M.
(Uptown)
Painted lines along entire length of street divide it into traffic lanes: Normal traffic lane is 10' wide)
(Downtown)
Rush-hour directions painted on pavement at street intersections
7:30 A.M. to 9:30 A.M.

found in the simple plan which is in use on some of Cleveland's main thoroughfares, and in modified form in Pittsburgh and Indianapolis. This is described and illustrated by B. F. Affleck, President of the Universal Portland Cement Co., of Chicago, in a recent issue of *Engineering News-Record*.

On selected streets in Cleveland that have four traffic lanes and no street-car tracks, inbound traffic uses three lanes in the morning, and outbound three lanes in the evening. Painted lines along the length of the pavement divide it into traffic lanes—normally 10 feet wide—and rush-hour directions are also painted on the pavement at intersections. In Indianapolis movable safety islands and movable traffic signs are used for the same purpose.

The prohibiting of parking during rush hours is a necessary part of this plan, in order to get as many lanes of traffic as possible. Streets 28 to 32 feet wide will provide two lanes for traffic in one direction, and one for traffic in the opposite direction. Street at least 36 feet wide can have four lanes, three of them for one-direction rush-hour traffic; and on streets 56 feet or more wide there can be four or five heavy-travel lanes and one or two for other traffic. Parking space is needed least during the morning and evening rush-hours, and the inconvenience is brief.

While this plan is not fundamental, it appears to be accomplishing its purpose as a measure of temporary relief of street congestion at small cost.

1907 to 1927 in City Planning

INSTEAD of the customary outline of the year's activities, the presidential address of John Nolen, of Cambridge, Mass., before the Nineteenth National Conference on City Planning, in Washington last month, took the form of a review of "Twenty Years of City Planning Progress in the United States."

An analysis of some of the factors which have affected American city life and city planning during the last two decades, with special emphasis on the skyscraper and the automobile, are followed by the query, "When we turn to city planning itself, what do we find twenty years ago?" To this Dr. Nolen's answer is, "Almost nothing."

"With the exception of the McMillan plan for a comprehensive park system for Washington (1901), prepared by a distinguished group, Burnham's plan for San Francisco (1905), and a few tentative and unofficial efforts, no comprehensive city plans, no master plans as we think of them today, had been prepared. There were no city plan commissions; the idea of the civic survey was unknown, as was regional planning also; no zoning ordinances had been passed or even discussed; there was no National Conference on City Planning and no American City Planning Institute; no teaching of city planning in technical schools or colleges; and virtually no books or other publications of note on this subject. Moreover, there was no interest in city planning among the people generally, except so far as it was beginning to express itself in a wider discussion of the 'city beautiful' in connection with civic centers and parks and playgrounds."

Contrasted with these conditions of twenty years ago are the following present-day facts and figures:

"The record shows that 157 cities, with a population of over 16,000,000, have been broadly replanned, for most of which the accompanying reports have been printed. These plans include cities in every state in the Union with the exception of Arkansas, Delaware, Idaho, Kentucky, Louisiana, Mississippi, Montana, Nevada, New Hampshire, North Dakota, Oklahoma, South Dakota, Utah, Vermont, and Wyoming. The greatest number of plans were prepared for cities of 50,000 to 100,000 population. The number of various population groups is as follows:

Population	No. of Planned Cities
1,000,000 or more	2
500,000 to 1,000,000	8
250,000 to 500,000	12
100,000 to 250,000	22
50,000 to 100,000	35
25,000 to 50,000	28
10,000 to 25,000	25
5,000 to 10,000	13
2,500 to 5,000	6
Under 2,500	6

"Official zoning ordinances have been adopted by 460 cities, more than three times the number of cities for which comprehensive plans were prepared. One-half the urban population of the United States is now living in zoned cities. All states have zoned cities except Arizona, Idaho, Kentucky, Mississippi, Montana, New Mexico, South Dakota, Texas, Vermont, West Virginia, and Wyoming; New York State leading with 77.

"City planning commissions have been established in 390 cities, with a population of over 30,000,000. There are city planning commissions in every state with the exception of Arkansas, Idaho, Mississippi, Nevada, New Mexico, and North Dakota. In Massachusetts, Pennsylvania, Ohio, California, Indiana, and Kansas state planning organizations in one form or another have been formed as federations of these city planning commissions. In Massachusetts planning boards are made mandatory in every city and town of 10,000 or more. In Pennsylvania city plan commissions are authorized in cities of the first, second and third class. In New Jersey plan commissions are authorized in cities, boroughs, and incorporated villages. In New York plan commissions are authorized in all cities, incorporated villages and towns. Cities in many states have been given more right to acquire land and a better chance to pay for it; in Massachusetts under the constitutional amendment adopted in 1911, which incorporates the principle of excess condemnation; in Ohio under the constitutional amendment adopted in 1912, providing for excess condemnation and the right to distribute the cost of improvements on specially benefited territory; and in Wisconsin and New York by a constitutional amendment allowing excess condemnation adopted by two legislatures and submitted to the people in 1913.

"During this period important city planning legislation has been passed and judicial decisions of great importance and influence have been rendered. The constitutionality of zoning has been upheld by the highest courts of California, New York, Arkansas, Illinois, Oregon, Rhode Island, Louisiana, Wisconsin, Massachusetts, Ohio, Minnesota and Kansas. The Supreme Court of the United States upheld zoning recently in important decisions in the Euclid Village and Minneapolis cases.

There follows an outline of organized activities in behalf of city planning and zoning; references to several publications of outstanding importance; a chronological list of city planning landmarks; and a list of problems demanding solution. In conclusion, Dr. Nolen states three convictions:

"First, that those who have worked for city planning, nationally, regionally or locally (and they are many), have put forth energy in a worthy cause and have done well. The record is not spectacular, but, considering the resources available and the inevitable difficulties, it is an honorable record. The movement has been united and wholehearted, and the results are creditable to all concerned. We have reason to cheer up.

"The second conviction is that beyond the threshold on which we now stand, there are municipal rural planning problems great in number and difficulty, and requiring more knowledge, skill and patience, and greater resources in money and well-directed effort, than have been heretofore available.

Part of this conviction is that if we are to find real solutions, we must dig still deeper into the subject itself, and more especially into a consideration of the related social, economic and governmental conditions which influence and color all that is now being done or attempted.

"A final conviction is the thrill of opportunity. Conditions and ideas are changing. Nothing is fixed. Life is eager. Minds are open. There is inspiration in the city plan, as well as a call to do routine work. The task requires the use of new materials, new methods, new ideas, and the formation of new habits. Part of that task is the gradual creation of an environment that will be so different from the present that without exaggeration it could be called new.

"As a last word, may I quote a prohetic paragraph or two from Lewis Mumford's 'Sticks and Stones':

" 'The future of our civilization depends upon our ability to select and control our heritage from the past, to alter our present attitudes and habits, and to project fresh forms into which our energies may be freely poured. . . . Home, meeting place, and factory; polity, culture, and are have still to be united and wrought together, and this task is one of the fundamental tasks of our civilization. Once that union is effected, the long breach between art and life, which began with the Renaissance, will be brought to an end.' "

American Grade-Crossing Record Compared with British and French

CALLING attention to the enormity of "The Grade Crossing Crime" in the United States, The American Automobile Association has made public figures disclosing that for the year 1925 one motorist out of every 9,000 registered in the United States lost his life in a grade-crossing accident, as compared with one out of every 65,000 in Great Britain and one out of 45,000 in France. According to the *American Motorist*, the answer to this striking disparity is found largely in the much greater degree of protection afforded motorists at grade crossings in the European countries selected for the comparison.

"Out of 232,755 grade crossings used by motorists in the United States only 27,161 have protection in any shape, manner or form," according to the A.A.A. statement, "thus leaving 205,594 entirely unguarded. On the other hand, out of 32,500 grade crossings used by motorists in France, 26,000 are thoroughly protected, leaving 5,640 unprotected. Great Britain makes an even better showing in the percentage of protected grades."

P & A Photo

HE DIDN'T BEAT THE FLYER

The driver jumped just in time to save himself when the Greenport flyer of the Long Island Railroad hit a 10-ton truck at Willis Avenue, Mineola

Progress in Uniform Motor-Vehicle Legislation

A REPORT of state motor vehicle legislation enacted thus far during 1927 has just been compiled for THE AMERICAN CITY by the National Conference of Street and Highway Safety. This supplements and brings up to date an article by Colonel A. B. Barber, Director of the Conference, in the issue of December, 1926, which summarized state activities in this direction at that time. It was at the conclusion of the National Conference on Street and Highway Safety meeting in Washington during March of last year, that a unanimous vote was taken naming delegates from each state as an organization committee to work for the adoption in that state of the Uniform Motor Vehicle Code as approved and published by the Conference.

Laws recently passed in Pennsylvania, North Carolina, and Minnesota are shown to follow closely the requirements of the Uniform Vehicle Code, while in Oregon already existing motor vehicle regulations have been supplemented by new laws which bring them into closer conformity with the standard requirements. Colonel Barber, in this new report, gives the following details from these states:

"Pennsylvania has passed an act which seems to combine the essential features of the four acts of the Uniform Vehicle Code, although the registration, certificate of title and licensing sections are considerably condensed. With respect to the rules of the road, in which exact uniformity seems most desirable, the Pennsylvania act appears to follow the Uniform Vehicle Code very closely. I am informed that the provisions relating to speed were somewhat modified before the act was passed, but I have not the details. I also have not definite information that the Governor has signed the bill.

"In North Carolina bills were passed covering registration certificates of title and operation of vehicles, and all three acts appear to follow the Uniform Vehicle Code closely. One of the new noticeable points of difference in the "Rules of the Road" act is the requirement in the North Carolina legislation of three hand signals instead of a single one. The North Carolina act also makes 25 miles instead of 20 miles the prima facie limit in residence districts and establishes an absolute limit of 45 miles per hour in open country instead of the 35-mile prima facie limit of the Vehicle Code.

"In Minnesota an act regulating the operation of vehicles on highways was adopted, and this appears to conform very closely to the corresponding act of the Uniform Vehicle Code.

"In Oregon there were already in operation motor vehicle laws adopted in 1921 and 1925 covering registration of vehicles, certificates of title, licensing (without examination) of drivers, and rules of the road, with a special drastic act relative to driving while intoxicated. Ten supplementary or amendatory acts were passed this year. Those most significant from the point of view of the National Conference on Street and Highway Safety are one substituting for the earlier legislation rules of the road that appear to follow closely the corresponding act of the Uniform Vehicle Code; an act embodying those features of the same act of the Uniform Code relative to the vehicle itself and its equipment; and revisions of a previous act relative to certificate of title. The Oregon 'Rules of the Road' act also calls for three hand signals instead of one, and includes the provision found in the laws of several states but rejected by the National Conference on Street and Highway Safety, that pedestrians must walk on the left-hand side of highways without sidewalks.

Detailed information relative to North Dakota, Idaho, and Washington has not yet been made available to the Conference, other than an account of the passage in North Dakota of acts covering registration, certificate of title, and operation of the vehicle. It has been reported from North Dakota that the public in that state is not yet ready for the licensing of operators. A somewhat similar situation is said to exist in Idaho, while the rules-of-the-road bill in Washington deviated in some important particulars (details of which are not at present available) from the Vehicle Code. Legislation in Utah, previously reported to and by the Conference as having carried, is now reported to have been defeated at the last moment, while legislation based upon the Code which has been pending in a number of other states is still to be reported upon.

Rules for Surviving Pedestrians

Suggestions by Henry H. Curran, Counsel of The City Club of New York, applicable to congested districts where skyscrapers exude pedestrians faster than sidewalks can keep pace

1. When two or three pedestrians are gathered together on a sidewalk, let them be at once dispersed with night-sticks. They block progress and they gum the game.

2. Walking three abreast should be punished with thirty days in the work house, ten days for each of the three offenders.

3. Turning swiftly to look into a shop window should be made a felony, unless the pedestrian extends his arm horizontally toward the window before he turns, rings a bell with his other arm, blows a police whistle, and has ready for inspection a guarantee that he will not merely look and leave, but will enter and buy. At night, swing a green light for starboard turn, red for port.

4. No man or woman possessed of competent legs may walk with a cane.

5. Shoulder pads, tweed coats and bustles beyond a reasonable beam are forbidden.

6. Spats may not be thicker than good wall paper.

7. Wide persons will wear hub caps on their hips.

8. Salutations will be by word of mouth only, unless the gesture be strictly fore and aft.

9. Baumes Laws to be amended to provide life terms in Sing Sing for those who fail to look, constantly and earnestly, in the exact direction in which they are proceeding. For this most heinous offense of all, we select Sing Sing, because the Baumes congestion with which that excellent country club already abounds, will provide a hilarious similarity, even unto the last day, to Fifth Avenue at its best congested moments.

For Reduction in the Beam

10. In order that we may not merely punish criminals, but instead do our bit toward preventing pedestrians from ever becoming criminals, the aldermen should pass an ordinance requiring the abolition of daily dozen reducing exercises for fore and aft reduction, and replacing these exer-

cises by such as will bring about a reduction in the beam.

11. Arms may not be swung. Earrings may.

12. Persons suffering from the 18th Amendment may not commit Charleston at corners.

13. Ban on bundles.

14. Umbrellas taboo.

15. One-way sidewalks, to the right, thus:

Northbound, take east side of avenue.
Southbound, take west side of avenue.
Eastbound, take south side of street.
Westbound, take north side of street.

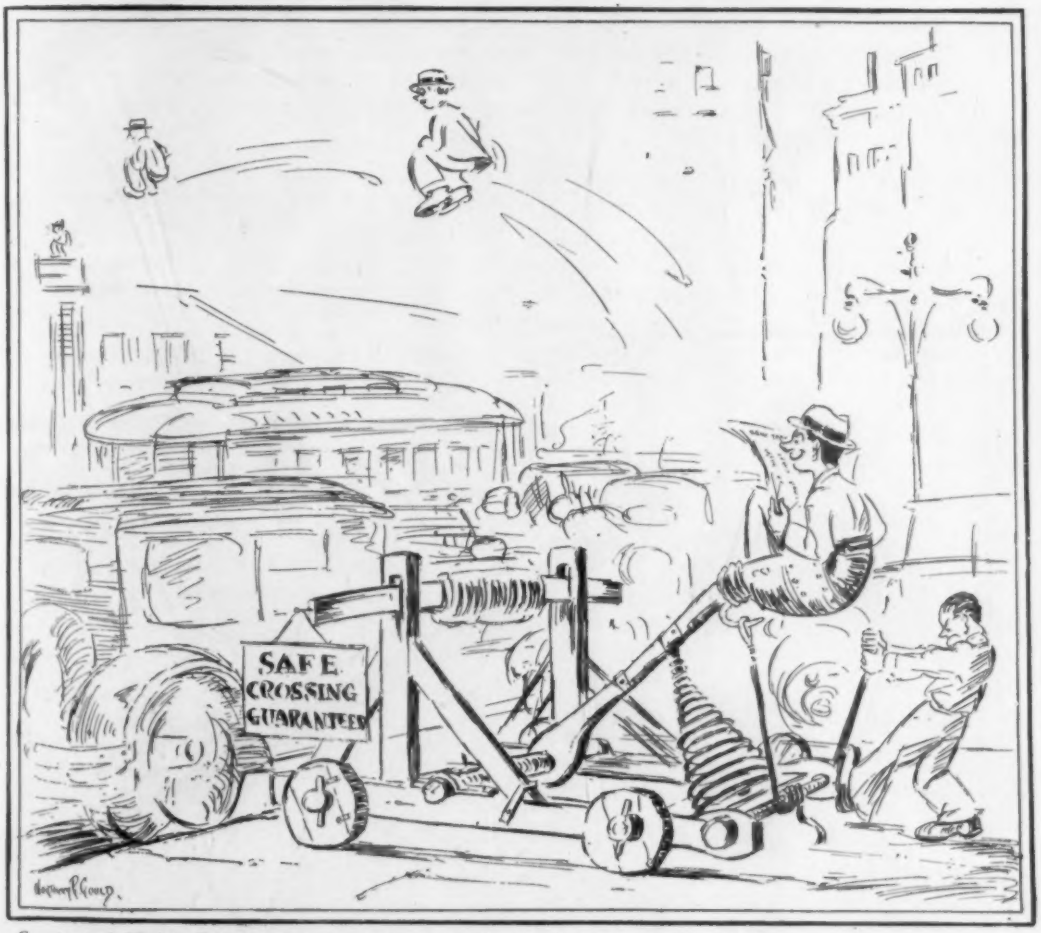
By way of being bucolic, *rus in urbe*, let us have a ripple system for pedestrians to take the place of the present cripple system. Then when we are rippled, we can fondly reminisce upon the old pond where "the mill goes 'round, 'round, 'round, with joyful sound, sound, sound," instead of reminiscing upon the leg we lost with a loud crack last year.

Crafty Crabs to Cut the Gordian Knot

16. Finally, to cut the Gordian Knot, we recommend that pedestrians learn to proceed sideways like a crab. At present we go chest forward, which is a wide way of going. In the army they used to reckon a soldier as 22 inches wide for drill purposes, but only 12 inches deep. It seems like sound sense to keep the 22-inch width of the pedestrian parallel to the path of a sidewalk—with the stream, rather than at right angles to it. For instance, as we walk down the west side of Fifth Avenue, let us turn our wishbones bravely toward the East like the Mussulman, and proceed southward sideways, thereby interposing only our puny 12-inch depth as a wedge into the multitudinous pedestrian traffic. With practice our feet will soon face fore and aft like the crab. Nature can do anything. She did it for the crab centuries ago, to the great relief of the ancient pedestrian congestion on the bottom of the ocean.

17. We invite full, free and hearty discussion of these suggestions, but insist that it take place in basements and back yards, and not on those delightful "sidewalks of New York," which now furnish such an interesting arena for the gladiatorial dying struggles of the New York pedestrian.

Modern Use for the Ancient Catapult



Courtesy of "Safety Education," published by the National Safety Council, New York

The Coldwell dealer nearest you will gladly demonstrate Model "L" on your own grounds. Also send for descriptive literature.

Why Park Superintendents

stand back of the Coldwell Model "L"

Velvety green, evenly-cut lawns are the aim of park superintendents. Therefore, the mowing equipment that helps them to achieve this aim deserves and receives their whole-hearted support.

Park superintendents throughout the country stand squarely in back of the Coldwell Model "L" motor lawn mower and roller because this machine helps them to maintain their lawns in *perfect* condition . . . and at the minimum of expense.

Model "L," with the gang units attached, rolls and mows *simultaneously* a swath of 60 inches. Thus one man with Model "L" can do the whole job and do it better than can two men with the ordinary equipment.

Model "L" cuts close up to and around trees and shrubbery, along walks and borders.

Negotiates extreme grades with ease, and readily conforms to contour of ground.

Coldwell Electric Lawn Mower. Plugs in on any electric outlet. All the operator has to do is to guide it. Just what you want for small plots and boulevard parkings. Send for booklet.

SINCE 1867

COLDWELL

***DEPENDABLE* LAWN MOWERS**

Hand *Horse*

Gasoline

Electric

COLDWELL LAWN MOWER CO., NEWBURGH, N. Y., U. S. A.

Do you mention THE AMERICAN CITY when writing? Please do.

Municipal Accounting and Finance

Conducted by Francis Oakey, C. P. A.
Member of the Firm of Searle, Oakey & Miller, New York

The General Fund

IN the attempt to distribute the cost of government as equitably as possible, municipalities have levied various taxes and assessments and have imposed a variety of special charges, the most common of which are the following:

1. A general tax levied at a specified rate upon the assessed valuation of real and personal property, intended to support those services and to finance those improvements which benefit all citizens alike.

2. Special assessments for street, sewer and other local improvements, levied upon the abutting property benefited thereby, at rates sufficient to defray the cost of the improvements.

3. Charges upon the consumer for the amount of power, gas or water consumed or used. These charges are intended to defray the cost of the service rendered.

4. A specified rate of fare charged to the passenger for transportation service rendered—intended to support the cost of operating the transportation system.

5. Charges to the individual or corporation for special—and sometimes exclusive—rights conferred by franchise, license, permit or privilege. These charges are intended to exact compensation for rights not enjoyed or availed of by all citizens alike.

6. Fees for services rendered to the individual at his request, collected as compensation for services not availed of by all citizens alike.

7. Fines and penalties intended primarily as deterrents from infractions of law or regulation, but having a compensating effect upon the distribution of the burden of the cost of government.

In their relation to the program of financing the city's expenditures, these seven increments to the public treasury fall into three classes, namely:

1. Those which reimburse the city for specific expenditures made, which include: assessments for local improvements, charges for power, gas or water, and fares collected for transportation service.

2. Those which do not relate to or offset any specific class of expenditure, but which reduce the amount which would otherwise have to be raised by a general tax. These include collections on account of franchises, fees for licenses, permits, privileges, transcripts and registrations of documents, etc., and fines and penalties.

3. The general tax intended to raise an amount of revenue sufficient to finance all expenditures of the city not reimbursed by special assessments or by charges for services directly rendered.

Reasons for Establishing Special Funds

In levying a special assessment for a local improvement it is the duty of the city to exact from the owners of the property benefited thereby only that amount which represents the share of the cost which the owners should justly pay—a portion of the cost being, in most cases, paid by the city. In order to discharge this obligation, a separate account must be kept of each assessable improvement, showing the amount expended and the amounts assessed and collected to finance the expenditures. Provided such accounts are kept, it is not essential that the moneys collected be segregated from the other collections. By these processes a special fund is established and maintained for each improvement, even though the moneys applicable to each improvement are not separately funded by deposit in a separate bank account.

In fixing rates for the charges for services rendered by a municipally owned public utility, the obligation exists to collect from the consumers or users a total revenue sufficient to operate and maintain the utility without producing any material amount of profit. To discharge this obligation, the receipts and expenditures of each public utility must be separately accounted for, thus establishing a special fund. Separate funding of the receipts by deposit in a separate bank account is not essential—the special fund being established by the process of accounting.

Reasons for Establishing the General Fund

Those classes of revenues which do not relate to or reimburse the city for any specific expenditures, commonly known as miscellaneous revenues, reduce taxation and therefore must be related to the general tax. In fact,

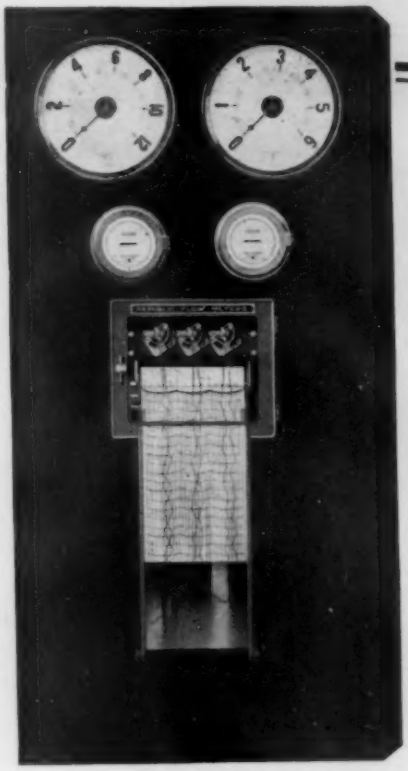
Unified Operation

The Republic Water Meter Panel Board

The centralizing of all reading instruments on one panel, and the recording of every essential operation on One Wide Strip Chart so that each record is separate and distinct, is the achievement of Republic Engineers.

The Panel Board illustrated at the right is one of the many combinations available. The two large dials at the top of the panel may be used to indicate any two flows regardless of whether they be water, gas, steam or air, or water levels or loss of head. The two integrating instruments accurately totalize the flows. The multiple recorder gives a continuous graphic record on One Wide Strip Chart of three or more records. They may be all water-flow records, water-pressure records, etc., or any combination desired of the following:

1. **Water Flow**
2. **Water Pressure**
3. **Water Level**
4. **Loss of Head**
5. **Gas Flow**
6. **Air Flow**
7. **Steam Flow**
8. **CO_2**
9. **Temperature**



Republic Water Meter Panel Board

Visit Our Booth at the

American Water Works Convention

Chicago, Ill.

Bulletin "Republic Water Meters" mailed on request.

REPUBLIC FLOW METERS COMPANY

Executive Offices and Plant: 2226 Diversey Parkway, Chicago, Ill.

Branch Offices in 25 Principal Cities

Republic Flow Meters Co.

CO_2 Recorders
Draft Instruments
Coal Meters
Recording Pyrometers
Indicating Pyrometers

Boiler Meters
Meters, Water and Steam
Meters, Gas and Air
Liquid Level Indicators and Recorders

when estimated for budget purposes, the total amount of such revenues is usually deducted from the total estimated expenditures for the general services and activities of the city for which provision has not been made for separate financing, the remainder being the estimated amount to be raised by general taxation. Thus the resources resulting from the collection of general taxes and of miscellaneous revenues are the means of financing the general services and activities referred to and form a fund known as the general fund, available for appropriation.

In passing acts of appropriation for the support of the general services and activities, the legislative body confers authority to spend certain sums for certain purposes and specifies that these expenditures shall be made from the resources of the general fund.

In order to make expenditures within the scope and purpose of these grants and in accordance with these mandates, it is necessary to establish a control over the appropriations granted and over the resources provided to finance them. For this purpose a special group of accounts must be kept for the general fund, showing on the one hand the resources available for expenditure, and on the other the amounts which may be spent. Such accounts present the condition of the general fund, and should show at all times the progress made in the collection of the taxes and miscellaneous revenues applicable thereto and the extent to which the appropriations have been expended.

The Resources of the General Fund

The resources of the general fund consist of the collectible taxes and miscellaneous revenues, estimated and accrued, which are available through act of appropriation for any purpose to which the legislative body may choose to apply them—that is, which are not specifically applicable by law to a special purpose. General speaking, five summary accounts may be used to express these resources, namely:

1. Estimated Revenues to Be Accrued or Collected
2. Taxes Accrued Not Collected
3. Miscellaneous Accounts Receivable
4. Due from Other Funds
5. Available Cash

The resource "Estimated Revenues to Be Accrued or Collected" represents the amount of revenues which have been estimated in the budget as applicable to the general fund, but which have neither been accrued nor collected. At the beginning of each fiscal year this resource is increased by the sum of the estimated taxes and miscellaneous revenues to be collected during the year; this sum equals the total amount appropriated for the year plus a reserve for uncollectible taxes. This resource is reduced by the amounts of taxes accrued, and these amounts are transferred to and increase the resource "Taxes Accrued Not Collected." It is also reduced by the amounts of miscellaneous revenues accrued or collected, and these amounts are transferred to and increase the resources "Miscellaneous Accounts Receivable" or "Available Cash."

The resource "Taxes Accrued Not Collected" represents the amount of taxes applicable to the general fund which have been assessed but not collected. This resource is reduced by the amounts collected and "Available Cash" is correspondingly increased.

The resource "Miscellaneous Accounts Receivable" represents the amounts of all revenues other than taxes applicable to the general fund which accrue and are entered as receivables prior to collection. As the collections are made, this resource is reduced and "Available Cash" correspondingly increased.

The resource "Due from Other Funds" does not always exist. It may occur, however, as a result of the performance of work or the consumption of supplies or materials—paid for out of the general fund—in connection with activities required by law to be financed by means of other funds. This is an account receivable which is liquidated either by journal entry or by an actual transfer of cash.

The resource "Available Cash" represents the unexpended accumulation of cash derived from collections of revenues applicable to the general fund.

The Obligations of the General Fund

The term "obligations" is a comprehensive one used to describe not only the current liabilities but also the commitments consisting of the unexpended balances of appropriations which must be met out of the resources of the general fund. Generally speaking, these "obligations" consist of four classes, namely:

1. Unencumbered Balance of Appropriations
2. Unliquidated Encumbrances
3. Reserve for Temporary Loans (issued in anticipation of the collection of taxes)
4. Due to Other Funds

The sum of the unencumbered balance of appropriations and the unliquidated encumbrances represents the unexpended balance of appropriations. The unencumbered balance represents the amount of appropriations which has

From Trinidad Lake to Buffalo, New York

Buffalo Appreciates Trinidad!

That Trinidad Lake Asphalt gives the utmost satisfaction is attested by the fact that there are Buffalo streets which have been paved with this marvelous nature-made material for as many as 46 years. And it is because of this satisfactory service that the city has constantly laid other Trinidad pavements.

The photograph above shows Niagara Square, around the McKinley Monument, which was paved with Trinidad Lake Asphalt in 1906—twenty-one years of wear and weather resistance *with practically no cost for maintenance.* And Trinidad pavements are besides attractive, resilient, free from noise, and easy to keep clean and repair.

For *road* building, Bermudez Road Asphalt—another native-lake product—has proved its merit. Interesting data on request.

The Barber Asphalt Company
PHILADELPHIA

New York Chicago Pittsburgh St. Louis Kansas City San Francisco

TRINIDAD LAKE ASPHALT

not been reduced or encumbered by purchase orders issued or contracts executed. The unliquidated encumbrances represent the amount of purchase orders issued or contracts executed which have not been filled or completed and for which vouchers have not been drawn.

Current Character of Resources and Obligations

The purposes sought in establishing and maintaining a general fund are (a) to control and properly account for the resources provided to finance the expenditures authorized under appropriations and (b) to control and properly account for appropriations and the expenditures chargeable thereto. The general fund is a financing medium designed as an aid in controlling, managing, collecting and spending the resources made available by law to satisfy the purposes or objects specified in acts of appropriation. Its resources therefore consist only of cash and those estimated and accrued amounts of revenues which develop into cash. Its obligations consist only of the unexpended balances of appropriations, money borrowed in anticipation of uncollected taxes and amounts currently due to other funds. Fixed property, although purchased under an appropriation, ceases to be a resource of the general fund because it is not a current asset available to meet expenditures.

Relation of General Fund to Budget

The general fund is an essential administrative instrument in the execution of the financial program. In fact, the provisions of the completed budget could not be carried out without the funding of revenues and the establishment of an accounting control over expenditures.

A properly prepared statement of the condition of the general fund not only is indispensable in the preparation of the budget but is the only means of determining from time to time during the fiscal year the progress of the programs of financing and of expenditure.

—*Copyright, 1927, Francis Oakey.*

The Municipal Bond Market

By Sanders Shanks, Jr.
Editor, *The Bond Buyer*

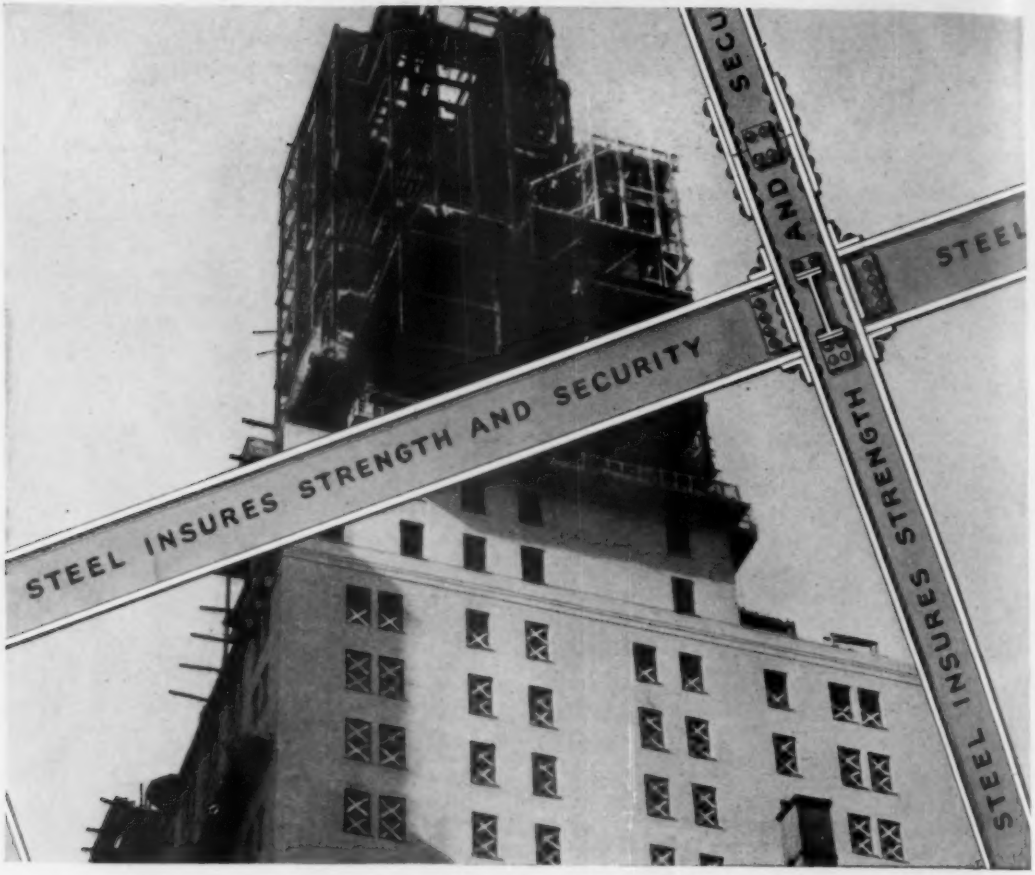
A SALE on May 11 of $60,000,000 New York City 4 per cent bonds at a price which brings the net interest rate down to 3.93 per cent clearly illustrates the extent to which the market value of municipal bonds has advanced since the first of the year. On January 6 New York sold an almost identical bond issue carrying a 4¼ per cent coupon, and the net interest rate was 4.12 per cent. If we may assume that the states and municipalities of the entire United States are increasing their bonded debts at the rate of $1,000,000,000 a year, this reduction of one-fifth of one per cent in the rate of interest represents an annual saving in debt service charges of $2,000,000, and, as the average term of the bonds is about ten years, that $2,000,000 saving will eventually grow to $20,000,000 for each billion dollars of bonds. In these days of rising tax rates, such savings are not to be overlooked.

An extremely active municipal bond market for many months to come seems assured. Demand for bonds must continue large so long as capital continues to accumulate rapidly, as is now the case. The consistently downward trend of interest rates is a compelling factor of great force influencing investors to purchase high-grade bonds as fast as the necessary funds become available. Should the supply of new municipal bond issues suddenly contract as little as 10 or 15 per cent, the result would be reflected at once in a further substantial advance in prices. This is not likely to occur, however. During the current calendar year almost every state legislature has been or will be in session. The result of the activities of these law-making bodies is already reflected in the authorization of thousands of new state, county, city, town and district bond issues. By way of illustration, it may be stated that the 1927 Tennessee Legislature enacted measures authorizing a total of over $65,000,000 worth of state and municipal bonds.

During the first four months of this year new issues sold reached the substantial total of $457,861,788, or slightly in excess of the largest amount previously reported for a corresponding period. The record will be broken again when figures for the five months ending June 1 are complete and, judging by the many large issues sale of which is now contemplated, the year 1927 is going to establish a new peak for public borrowing. This ample supply will, of course, balance the scales against the heavy demand already referred to and will operate against any sudden advance in market values.

The following list of representative issues shows the downward trend of interest rates:

Amount	*Issue*	*Rate* %	*Term*	*Yield* %
75,000	Newton, Mass..	3¼	1-15 Ser.	3.51
220,000	Holyoke, Mass..	3¼	1-10 Ser.	3.65
4,288,000	Boston, Mass..	3½&4	21¼ Avg.	3.83
500,000	Fayette Co., Pa.	4¼	15 Yr.	3.85
6,000,000	Illinois	4	18-29 Ser.	3.90
60,000,000	New York, N.Y.	4	1-40 Ser. & 50 Yr.	3.936
400,000	Niagara Falls, N. Y.	3.95	29-33 Ser.	3.94
240,000	Troy, N. Y...	4½	1-20 Ser.	3.95
4,000,000	West Va.	3¾ & 4	17 1/3 Avg. & 24 1/6 Avg.	3.961
1,250,000	California	4¼	6⅔ Avg.	3.97
140,000	Ramsey Co., Minn.	4	5¾ Avg.	3.99
		4¼	7 5/6 Avg., 1-5 Ser., 1-10 Ser. & 20 Yr.	3.99
550,000	Gd. Rap., Mich.			
2,000,000	Kan. City, Mo., Sch. Dist. ..	4	19¾ Avg.	3.99
100,000	Detroit, Mich..	4¼	1-4 Ser.	4.07
35,000	Logan Tp., Ind., Sch. Dist. ..	4½	8 5/6 Avg.	4.08
150,000	Los Angeles, Calif., Pasadena City H. S. Dist.	4¼	15 Avg.	4.20
140,000	Jacksonv'e, Fla.	5	8½ Avg.	4.32
195,000	Clats'p Co., Ore.	4¼	11 5/6 Avg.	4.72



"STEEL NEVER FAILS"

This is the title of an illustrated manual which the American Institute of Steel Construction has prepared for distribution, not only to technical specialists, but to owners, prospective builders and public officials. It tells the story of structural steel as it has never been told before.

The distribution of "Steel Never Fails" is only one factor in the present national educational effort of the Institute. Extensive advertising is appearing. The Institute's Code of Practice and Standard Specifications are already in use in more than 100 cities in the United States and Canada with an estimated saving of $30,000,000 a year to owners and taxpayers. Write for complete details now. We will also send a complimentary copy of "Steel Never Fails."

This advertisement is published by the American Institute of Steel Construction, a non-profit service organization of 218 members comprising the structural steel industry in the United States and Canada. Contributing also to the educational fund are these great rolling mills: Bethlehem Steel Company, The Colorado Fuel and Iron Company, Inland Steel Company, Jones & Laughlin Steel Corporation, Scullin Steel Company. The purpose of the Institute is to extend the use of structural steel in construction work of every size and type, from residences to skyscrapers and bridges. The Institute offers fullest cooperation with architects, engineers, the public and all branches of the building trades. Correspondence invited. Address: Lee H. Miller, M. Am. Soc. C. E., Chief Engineer, AMERICAN INSTITUTE OF STEEL CONSTRUCTION, Inc., 285 Madison Avenue, New York City.

Do you mention THE AMERICAN CITY when writing? Please do.

The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Extra-Territorial Rights of Cities Must Be Clearly Conferred

A provision of the Michigan constitution, empowering the city of Detroit to acquire property within or beyond the corporate boundaries for park purposes, is not self-executing, but requires legislative enactment, holds the Michigan Supreme Court in the case of City of Detroit vs. Oakland Circuit Judge, 212 North Western Reporter, 207. The Court said, in passing:

"'The general doctrine is clear that a municipal corporation cannot usually exercise its power beyond its own limits. If it has in any case authority to do so, the authority must be derived from some statute which expressly or impliedly permits it.' . . .

"The writer is in full accord with as extensive a grant as may be of the right of home rule, so called, to cities. But such grant must obtain expression by legislative enactment or in the constitution. There is no legislation conferring upon cities the right contended for here, and it is a far cry to urge that the permission, given them by the constitution to acquire parks within and without their corporate limits, *ipso facto*, and without any prescribed procedure of any sort, gives them such permission by the exercise of the right of eminent domain."

Railroad Property Subject to Paving Assessments—Variation of "Block" Areas Does Not Vitiate Levy of Assessments

The validity of special assessments levied against a railway right-of-way and station grounds for street paving was upheld by the United States Circuit Court of Appeals, Eighth Circuit, in the case of St. Louis-San Francisco Railway Company vs. City of Tulsa, 15 Federal Reporter, 2d Series, 960.

The same opinion holds that the word "block," as used in provisions of the city's charter for levying such assessments against abutting blocks, means areas bounded by streets and avenues, and is not limited to blocks platted as such. Therefore, the circumstance that blocks on one side of a street may be deeper than those on the other side does not defeat the levy of assessments against abutting property to the center of the block.

Basing a Municipal Judge's Compensation on Fines Collected Is Unconstitutional

The guaranty in the United States Constitution that one shall not be deprived of liberty or property without due process of law is violated by a statute or ordinance that bases a magistrate's compensation on fines assessed by him, holds the highest court of the land in the case of Tumey vs. State of Ohio, 47 Supreme Court Reporter, 437.

The decision establishes the invalidity of all legislative schemes under which a magistrate finds an incentive to convict those accused of violating the liquor, motor vehicle, etc., laws, in the circumstance that his costs or compensation is payable only from fines assessed.

The case arose under an ordinance of the village of North College Hill, a suburb of Cincinnati, and a prosecution for possessing intoxicating liquors. The high spots of the opinion are:

"That officers acting in a judicial capacity are disqualified by their interest in the controversy to be decided is of course the general rule. . . .

"A system by which an inferior judge is paid for his service only when he convicts the defendant has not become so embedded by custom in the general practice, either at common law or in this country, that it can be regarded as due process of law, unless the costs usually imposed are so small that they may be properly ignored. . . .

"The Mayor received for his fees and costs in the present case $12, and from such costs under the prohibition act for seven months he made about $100 a month in addition to his salary. We cannot regard the prospect of receipt or loss of such an emolument in each case as a minute, remote, trifling, or insignificant interest. It is certainly not fair to each defendant brought before the Mayor for the careful and judicial consideration of his guilt or innocence that the prospect of such a prospective loss by the Mayor should weigh against his acquittal."

A Court Outlines the Coverage of a Policeman's Bond

In the case of Indemnity Insurance Company of America vs. Bonta, 289 South Western Reporter, 231, passed upon by the Kentucky Court of Appeals, the principal questions raised pertained to the liability of a policeman's surety for an assault and battery claimed to have been committed by the officer. The Court laid down the following rules:

The surety on such a bond is not liable for punitive damages for a wrongful assault committed by the policeman. The liability is limited to compensatory damages for the injury.

Nor does such a bond extend to acts committed by the policeman in his capacity as an individual. It applies only to acts committed within the scope of his official authority.

Unnecessary beating of one under arrest renders the policeman and his surety liable on the official bond.

City Is Not Liable for Ice Falling from the Cornice of a Private Building

A pedestrian while walking along a sidewalk in a street at Ogdensburg, N. Y., was injured through fall of ice from the cornice of a four-story building. The city was joined as co-defendant with the owner of the building in a suit brought for damages. Ordering dismissal of the suit, the Appellate Division of the New York Supreme Court said in the case of Klepper vs. Seymour House Corporation of Ogdensburg, 218 New York Supplement, 476:

"We think the defendant city was not liable in negligence for failure to remove the snow and ice or to take measures to prevent its fall upon pedes-

Tarvia

For Road Construction Repair and Maintenance

To the driver of a Tarvia distributor 7 o'clock means 7 o'clock. Dispatched from the plant with railroad precision, Tarvia distributors arrive on the job on time — ready for immediate — and efficient — operation.

"7 o'clock—we're ready! Let's go."

The Barrett Company

New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Cincinnati, Kansas City, Detroit, Salt Lake City, Birmingham, Lebanon, Minneapolis, Milwaukee, Bethlehem, Columbus, Youngstown, Syracuse, Toledo, Rochester, Baltimore, Providence, Buffalo

In Canada:

THE BARRETT COMPANY, Limited

Montreal, Toronto, Winnipeg, Vancouver

Mention THE AMERICAN CITY—it helps.

trians. We have heretofore held that the city was not liable in nuisance because it had not the power to go upon the premises of the Seymour House Corporation and remove or reconstruct the cornice which, it is asserted, was of such a design that it constituted a menace to travelers upon State Street. It is equally true that the city could not, without committing a trespass, go upon the roof of the Seymour House wing to remove snow from the cornice or to take measures to prevent its fall. . . .

"We are referred to no case wherein it has been held that it is the duty of a city to warn pedestrians of a peril to a street user which proceeds from structures upon private land abutting upon the street."

A similar decision was reached long ago by the Massachusetts Supreme Judicial Court in the case of Hixon vs. City of Lowell, 13 Gray Reports, [illegible].

Ordinance Prohibiting Pedestrians from Crossing Streets at Other Than Marked Points—Upheld

The city of Laurel, Miss., has an ordinance providing for marked 8-foot paths across certain streets at intersections. Pedestrians are forbidden, under penalty of a fine of not more than $100 and/or not more than thirty days' imprisonment, to cross these streets at other points. Motorists, under the same penalty, must not drive across the footways faster than 8 miles per hour.

The validity of this ordinance was upheld by the Mississippi Supreme Court in the case of Snyder vs. Campbell, 110 Southern Reporter, 678.

A Taxpayer Cannot Sue to Restore Funds Equitably, Although Irregularly, Disbursed.

Mere irregularity in municipal action does not afford ground for legal action by a taxpayer, notes the Wisconsin Supreme Court in the case of Murphy vs. Paull, 212 North Western Reporter, 402. "To sustain a taxpayer's action, there must be shown (1) a wrongful act of the municipality, and (2) injury to the complaining taxpayers. . . . The action does not lie where it would be grossly inequitable to enforce the claim." The courts will enjoin an irregular act, but will not order repayment of money equitably, although irregularly, disbursed.

Franchise for Use of Streets Granted by Municipality Cannot Be Revoked At Will

In granting a temporary injunction against an attempted repeal of a permit for operation of motor-busses in defendant city, the New York Supreme Court for Schenectady County said in the case of Bohl vs. City of Schenectady, 220 New York Supplement, 249:

"A franchise is a grant under authority of government, conferring special right to do an act or series of acts of public concern which, when accepted and exercised, becomes an irrevocable contract. . . . It is now too firmly established to admit of question or dispute that a municipal ordinance, whether it be called a franchise or a permit, granting a right to use the streets, is more than a mere revocable license. The right which is acquired under such a grant has all of the attributes of property, and after it has been given and exercised, it cannot be revoked. It is a grant of a property right, assignable, taxable, alienable, an asset of credit value, subject to levy and sale under execution and to condemnation under the exercise of the power of eminent domain. . . .

"The grant of a right to use the streets is generally considered the grant of a vested right which the municipality cannot revoke after acceptance, except for failure to comply with the terms of the grant, or for other good cause, or where expressly authorized by statute."

Whether a Sewage Disposal Plant Is a Nuisance Is Tested by the Particular Circumstances

That a sewage disposal plant does not necessarily constitute a nuisance, just because located, or proposed to be located, near a private dwelling-house, was declared by the Texas Court of Civil Appeals at Austin in the late case of Boyd vs. City of San Angelo, 290 South Western Reporter, 833. The location and the manner of operation is determinative of the question of nuisance or not. The Court added:

"If operation of such plant, which is essential to the welfare of the community, damages appellants' property, they have their remedy at law, but that question must be left to the test of operation."

Fire Department of City Held to Be Subject to Mandatory State Statute

A statute in Indiana is interpreted by the Supreme Court of that state as making it mandatory for cities of more than 15,000 population, maintaining a regularly organized paid fire force, to divide the force into two platoons, one for day service and one for night service. (State vs. Morris, 155 North Eastern Reporter, 198.) And it is held that, so interpreted, the law is not unconstitutional as unreasonably interfering with the prerogative of self-government. Making specific application of the law, the Court said:

"The city of New Albany is a political subdivision of the state. Its governmental and administrative power is by virtue of legislative authority. Within its territorial jurisdiction it is an agent of the state, and, except as specially restrained by constitutional restrictions, it is within the continuous exclusive control of the Legislature."

Ordinance Discriminating Against Non-Resident Bakers Is Void

An ordinance of the city of Holton, Kan., purported to prescribe a penalty for a sale of bakery products within the city by non-residents without first paying an annual license fee of $150. Residents of the city were wholly exempted from the payment of such a fee. Declaring the ordinance to be void, the Kansas Supreme Court holds that it constitutes an unconstitutional discrimination against non-residents. (Ex parte Irish, 250 Pacific Reporter, 1056.)

For the full text of an important new decision of the United States Supreme Court on Zoning, see page 744.

THE ONLY DITCHER THAT KNOWS WHAT TO DIG AND WHAT NOT TO DIG

Feels Its Way With the Overload Release

WATCH a Barber-Greene feel its way through a maze of underground. Watch the digging teeth stop when they meet a hidden main—without hardly scratching it.

The release lets go automatically when an obstruction like that is encountered—jumps back into action automatically—and, if you wish, will carry the Barber-Greene through tough going and yet never harm a pipe it meets—as you can see above.

And that's digging.

If you're interested in a new field of contracting profits spend a few minutes looking over the pictures and cost records of actual jobs in "Ditching Snapshots and Records." Your copy is awaiting your card.

BARBER-GREENE COMPANY, 515 W. PARK AVE., AURORA, ILLINOIS

Barber-Greene

Barber-Greene Ditcher

Representatives in 50 Cities

DISC FEED LOADERS VERTICAL BOOM DITCHERS
STANDARDIZED PORTABLE AND PERMANENT BELT CONVEYORS
SNOW LOADERS CAR UNLOADERS COAL LOADERS

Zoning Notes

Prepared by Frank B. Williams

Author of "The Law of City Planning and Zoning"

From data collected by the Zoning Committee of New York (233 Broadway)

Recent Zoning Statutes

NEBRASKA.—General Enabling Act, April, 1927.

NEW JERSEY.—Act Regulating Procedure of Boards of Adjustment, Laws 1927, Ch. 203.

TEXAS.—General Enabling Act, following Standard Act for the most part. April, 1927.

Latest Decisions in New Jersey and United States Courts

In *Oxford Construction Co. v. City of Orange,* the highest court in New Jersey, following its own "Nutley" case, ordered on May 16 a permit to be issued for a five-story apartment house in a single-residence district. The decision of the Supreme Court of the United States was brought to its attention; but this case it declares not to be strictly in point, since the United States court simply affirmed the constitutionality of zoning generally, while the New Jersey court was considering a specific clause in a given ordinance, which it feels itself compelled to hold invalid.

On the same day there was handed down an opinion of the Supreme Court of the United States, upholding a specific clause in a Los Angeles zoning ordinance creating a general residence district. The case is *Zahn and Ross v. Board of Public Works;* the opinion in full is published on page 744 of this issue of THE AMERICAN CITY.

Our readers will recall the case of *Beery v. Houghton,* also in the Supreme Court of the United States, in which the validity of the single-family residence district was upheld. The New Jersey courts are not bound, in their interpretation of the New Jersey constitution, by the decisions of the United States courts; and evidently are not sufficiently influenced by them to change their rulings.

Recent Zoning Decisions

CALIFORNIA.—*Thille v. Board of Public Works of City of Los Angeles,* 52 Cal. App. Dec. 927. Reasonable provisions for front yards or setbacks under the police power are valid.

COLORADO.—*Colby v. Board of Adjustment, Supreme Court, April,* 1927. The petitioner's property is in a "Residence B" district. The building inspector denied him a permit to operate a brick-making plant on his premises, and on appeal to the Board of Adjustment, the action of the inspector was confirmed. Held, on appeal to this Court, that the decision of the Board be upheld. The Court, following the decision of the Euclid Village case in the Supreme Court of the United States, holds reasonable zoning to be constitutional. Under the circumstances the action of the Board in refusing to allow a variance of the ordinance cannot be said to be unreasonable. The petitioner has no vested right against the exercise of the police power.

ILLINOIS.—*Village of Western Springs v. Bernhagen, Supreme Court, April,* 1927. The village ordinance placed substantially all the territory of the village except that within a block of the railroad, in a single-family residence district. The appellant has established and engaged in the business of selling gasoline since the passage of the ordinance. *Held,* after a full review of the situation, including the uses of the neighboring property, that the ordinance was reasonable, and the action of the appellant without justification.

NEW JERSEY.—*Johnston v. Hague, Supreme Court,* 136 Atl. Rep. 407. An ordinance, based on Laws 1920, p. 436, prohibiting a garage for more than five cars within 150 feet of a church, or on any block frontage in which there is a church, is valid.

NEW JERSEY.—*Nelson Building Co. v. Greene,* 136 Atl. Rep. 503. The head note reads: "That building inspector thought that plans submitted to him provided for a four-story building for sixteen families instead of a five-story building for thirty families, *held* not to justify revocaton of building permit forty-eight days after its issuance and after demolition of a $10,000 building on the premises."

PENNSYLVANIA.—*Texas Co. v. City of Bethlehem, Court of Common Pleas, Northampton County.* Where an application to a board of appeals has been decided adversely to the applicant, the remedy is an appeal to the Court of Common Pleas, and not an application for mandamus. See in this connection *City of Bethlehem v. Goodman,* in the same court.

RHODE ISLAND.—*Madden v. Zoning Board of City of Providence,* 136 Atl. Rep. 493. Owners of land adjoining that on which the Zoning Board of Review authorized the erection of a proposed building alleged to violate the zoning ordinance are "persons aggrieved," and as such have the right to bring certiorari from that decision.

Recent Zoning Literature

"Supply and Demand" is the title of an article in *Pacific Municipalities* for March, 1927, by Gordon Whitnall, City Planning Director of Los Angeles. It is a study of the area devoted to various uses by the Los Angeles ordinance, and the area actually occupied for these uses. It indicates that, in many cases, too much space may be allowed by law to business, and as a result the land may be lowered in value and usefulness.

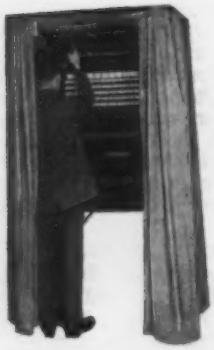
The second annual report of the Zoning Board of Adjustment of the City and County of Denver has appeared under date of February 11, 1927. A similar report for Baltimore was published in the Baltimore *Municipal Journal* of April 25, 1927. The third annual report of the Board of Zoning Adjustment of Boston for 1926 has also been published. It is Document 36—1927, and is dated February 1, 1927.

Elected Today---Tomorrow Defeated!

Errors in Counting the Votes Have Upset Many an Election---The Voting Machine Brings *Absolute Accuracy*

ELECTION officials rarely are skilled in the tabulation of figures. The counting of ballots, too, is done—unfortunately—after a long, tedious day at the polls. Weary, tired and sleepy, their minds ever growing less alert, the officials confront the most important part of their work—counting the votes.

IS it any wonder that mistakes are made? Is it any wonder that many a candidate has found himself elected on the first count and thrown out of office after a canvass of the vote disclosed gross errors?



THE voting machine *cannot* make a mistake. It is mechanically accurate—as dependable as the adding machines in a big bank. The votes are counted automatically, as they are cast. The counter compartment, illustrated above, is simply a series of adding machines with indicators to show the totals when the machine is unlocked after the polls have closed.

In 1,800 cities, towns and villages voting machines are being used to make certain an accurate tabulation of the vote.

AUTOMATIC REGISTERING MACHINE CO., INC.

JAMESTOWN **NEW YORK**

WRITE TODAY FOR ILLUSTRATED DESCRIPTIVE BOOKLETS

Municipal and Civic Publications

Prices do not include postage unless so stated

Ventilation and Health.—By Thomas D. Wood, A.M., M.D., Professor of Physical Education and Advisor in Health Education, Teachers College, Columbia University, New York, and Ethel M. Hendriksen, former Executive Secretary, Tuberculosis and Public Health Association of Rochester and Monroe County, New York. D. Appleton & Co., New York. 1927. XVII + 210 pp. $2.00.

After assailing various time-worn theories of ventilation, particularly as to the dangers of carbon dioxide and organic matter in exhaled air, and as to the supposed virtues of heating air before introduction into rooms, the authors declare that high temperature and improper humidity are the qualities chiefly to be avoided in air, and advocate modified window ventilation, with ceiling outlets, as opposed to elaborate systems such as have been installed in many school buildings. The simpler system is argued to be applicable to factories, offices, stores, theaters, churches, hospitals and private dwellings, as well as to schools. Methods of applying it are described, together with various devices to aid ventilation, and instruments used for measurements. Stressing the need of public education in fresh air and ventilation, the book suggests community programs for this purpose.

Proceedings of the Sixth Annual Meeting of the Highway Research Board.—A well-printed and illustrated paper-bound volume of 429 pp., reporting the meeting held at Washington, December 2-3, 1926. It is edited by Charles M. Upham, Director, and S. S. Steinberg, Assistant Director, of the Highway Research Board. Part I, comprising 16 pp., is about the development, organization and membership of the Board, which comes under the Division of Engineering and Industrial Research of the National Research Council, which in turn arises from the National Academy of Sciences. Part II gives the program of the meeting, the reports of the director and of various committees, progress reports, special papers, the minutes, and the registration. $2.00. (Apply to Publication Office, National Research Council, Washington, D. C.)

The Housing Policy of the Municipality of Vienna.—A survey of the activities of the city of Vienna since the end of the war towards overcoming the shortage of dwellings and raising the standard of housing. There is a handsome 64-page booklet in German, with many striking illustrations of housing structures, and also a folded map representing a bird's-eye view of Vienna with the various municipal housing developments indicated thereon. An English translation is also available, in 38 pp., without illustrations. 1926. (Apply to International Federation for Housing and Town Planning, 25 Bedford Row, London, W.C. 1, England.)

Venereal Disease Control.—An article in the April number of the *Journal of Social Hygiene*, by William F. Snow, M.D., Director, Susan B. Bristol and Mary S. Edwards, Statisticians, American Social Hygiene Association. It is an analytic summary of the venereal disease section of the Survey of Municipal Health Department Practice in the United States in 1923. Certain comparisons with previous reports are made. 40 pp. 35 cents. (Apply to Boyd Printing Company, 372 Broadway, Albany, N. Y.)

Outline for a "Master" Community Survey.—A 52-page mimeographed outline, prepared by the Civic Development Department of the Chamber of Commerce of the United States. An introduction sets forth the importance of a broad survey that will present a picture of the community as a whole and that should be available before specialized technical surveys for specific purposes are undertaken. The outline proper covers 38 pp. (Apply to the Department, Washington, D. C.)

County Government Law Applicable to North Carolina Counties.—A 38-page booklet bearing the names of the County Government Advisory Commission of North Carolina, and containing the text of five legislative acts relating to the subjects of government methods, fiscal administration, issuance and payment of bonds and notes, tax collection, and tax deeds and foreclosures, with respect to counties, as adopted by the 1927 Legislature. (Apply to Secretary of State, Raleigh, N. C.)

Financial Statistics of Cities, 1925.—This is the annual report of the Bureau of the Census, showing the financial statistics of 247 cities having a population of over 30,000, for the fiscal year 1925. THE MUNICIPAL INDEX (1927) was given permission to include (pp. 97-104) the advance summary of financial transactions, assessed valuations, per capita levies, and net debts by population groups, and also for the 81 cities of over 100,000 population. Similar statistics of cities from 30,000 to 100,000 population appeared in THE AMERICAN CITY in March and April, 1927. The volume now at hand gives the complete statistics, in much detail and includes, besides the topics above mentioned, data on specified assets of cities and the value of their public property, and also the revenues and expenses of municipal public-service enterprises and the investment therein. 503 pp. $1.25. (Apply to Government Printing Office, Washington, D. C.)

Bulletin of the Pennsylvania Association of Planning Commissioners.—This Association, organized in 1926, issues this 11-page mimeographed bulletin, dated April 1, with others expected to follow, telling of the city planning sessions of the 1926 and 1927 conferences of the Pennsylvania League of Cities of the Third Class. (Apply to Bureau of Municipalities, Pennsylvania Department of Internal Affairs, Harrisburg, Pa.)

City Planning Progress in Pennsylvania.—A report in the April 1 Bulletin of the Pennsylvania Association of Planning Commissioners, giving the state of advancement of city or county planning in Pennsylvania, with special reference to Pittsburgh, Allegheny County, Allentown, Altoona, Bethlehem, Chester, Harrisburg, Johnstown, Lancaster, and Monessen. (Apply to Bureau of Municipalities, Pennsylvania Department of Internal Affairs, Harrisburg, Pa.)

Safety Codes for the Prevention of Dust Explosions.—Bulletin No. 433 of the United States Bureau of Labor Statistics. These codes represent the tentative American Standard on the subject, as approved by the American Engineering Standards Committee, July 2, 1926; they are sponsored by the National Fire Protection Association and the United States Department of Agriculture. They cover starch factories, flour and feed mills, terminal grain elevators, sugar and cocoa manufacture, and pulverized-fuel systems. January, 1927. 40 pp. 10 cents. (Apply to Superintendent of Documents, Government Printing Office, Washington, D. C.)

Report on the Philadelphia Police Pension Fund.—This is a 13-page mimeographed report of the Special Committee on Pensions to the Committee on Municipal Affairs of the Philadelphia Chamber of Commerce. It is the result of several months of study of the pension situation in the leading cities of the country, with special reference to that in Philadelphia. The latter is severely criticized and four specific recommendations are made, the chief one being that an actuarial basis be adopted. (Apply to the Secretary of the Chamber.)

Tax Exemption in the 48 States.—A preliminary report entitled "TAX EXEMPTION in State of New York," by the Special Joint Committee on Taxation and Retrenchment, being Legislative Document (1927) No 86, dated February 15, 1927, and comprising 263 pp., contains in Appendix VII a 74-page compilation of provisions of the constitutions and the statutes of the various states relative to exemption and non-exemption from taxation of property used for religious, educational, and charitable purposes; and 7 pp. of provisions of the statutes of the various states exempting from taxation certain businesses and industries. (Apply to Gerald G. Casey, Clerk of the Committee, Senate Chamber, Albany, N. Y.)

Indoor and Outdoor Swimming Pool Sanitation.—A 5-page article by Bengt N. Bengtson, M.D., in the April, 1927 issue of *The Nation's Health*. Dr. Bengtson is Director of the Garfield and Humboldt Parks Natatoria, Chicago, and Instructor in Bacteriology at the University of Illinois Medical School, Chicago. He discusses the eradication of possible transmissable mediums for any communicable disease from the swimmer, the water, and the tank, and makes practical suggestions. 50 cents. (Apply to The Modern Hospital Publishing Co., 22 East Ontario Street, Chicago, Ill.)

THE MANUFACTURERS' APPRAISAL COMPANY

is the only recognized appraisal organization that specializes in Tax Assessment Services by way of assistance to local assessing officials. Our Somers System Service, which has been installed in scores of American cities, establishes a fair and equitable basis for taxation.

We operate a real System; we have an organization of trained and experienced valuation experts; and the results of our work are satisfactory to taxpayers and assessors.

If your community is interested in equality and uniformity in real estate assessments, write for booklet and full information.

Philadelphia (Executive Office)
Cleveland (Home Office)
District Offices:
New York
Chicago

The Manufacturers' Appraisal Company
Established 1899
WALTER W. POLLOCK, *President*

District Offices:
Detroit
Pittsburgh
St. Louis
Atlanta
Boston
Springfield, Mass.

List of Municipal Research Agencies.—The Municipal Administration Service compiled in May a list of municipal research agencies, thus bringing previous lists up to date. It is available in mimeographed form, covering five pages. It lists 72 such agencies in the United States, 4 in Canada, and 4 in other countries. The address of each agency is given, together with the name of the director or secretary, and in some cases that of the president or chairman, and the date of establishment. (Apply to Municipal Administration Service, 261 Broadway, New York.)

Proposed Procedure for the Preparation of an Improvement Program and a Plan of Financing.—This was prepared by the Engineer of the Cincinnati City Planning Commission, and the Director of the Cincinnati Bureau of Municipal Research, for a special committee on improvement program procedure, and was submitted in the form of a 9-page mimeographed report, under date of March 23, 1927. (Apply to Cincinnati Bureau of Municipal Research, 312 West 9th Street, Cincinnati, Ohio.)

Tax Burdens Compared—Farm, City, Village.—A 26-page booklet, constituting Bulletin 393 of the Agricultural Experiment Station, University of Wisconsin, Madison, Wis., dated March, 1927. It shows a much larger percentage of farm incomes paid out in direct taxes than is the case with incomes of city and village dwellers, since the war, and gives as reasons the failure of farm incomes to increase in the same proportion as city and village incomes, and the operation of the general property tax during the deflation period. (Apply to the Station.)

Colorado Electric, Water and Gas Rates.—A booklet of 31 pages and a large tabular insert, issued by the Colorado Municipal League from its headquarters at the Bureau of Business and Government Research, University of Colorado, Boulder, Colo. It gives the electric rates for 158 cities and towns, water rates for 164, and gas rates for 13. March, 1927. $1.00. (Apply to the League.)

Tanks.—Regulations of the National Board of Fire Underwriters for the construction and installation of tanks,—gravity and pressure, towers, etc.—as recommended by the National Fire Protection Association. 1926 edition. A pocket booklet of 104 pages. (Apply to the Association, 40 Central Street, Boston, Mass.)

A List of References on Municipal Reporting.—A compilation by O. F. Nolting, Secretary of the Municipal Reference Bureau, University Extension Division, University of Kansas, Lawrence, Kan., under date of May 1, 1927. Four mimeographed pages, listing books and magazine articles and notable municipal reports. (Apply to the Bureau.)

Sewage Treatment.—Bulletins 84, 86 and 88 of the Extension Engineering Department of Iowa State College, Ames, Iowa, and Official Publication, of the College, Nos. 28, 35 and 46 of Vol. XXV, dated December 8, 1926, January 26, 1927, and March 5, 1927, respectively. Papers presented at the Eighth Conference on Sewage Treatment at Ames, Iowa, October 16-18, 1926: Bulletin 84 (7 pp.), Grit Chambers and Sewage Screens, by Howard Green, Cedar Rapids, Iowa; Bulletin 86 (7 pp.), Intermittent Sand Filters, by Ernest Boyce, Chief Sanitary Engineer, Kansas State Board of Health; and Bulletin 88 (31 pp.), Stream Pollution and Sewage Disposal, four papers by I. W. Mendelsohn, U. S. Public Health Service, H. V. Pederson, Water-Works Manager, Marshalltown, Iowa, and C. H. Currie and N. T. Veatch, Jr., consulting engineers, of Webster City, Iowa, and Kansas City, Mo., respectively. (Apply to Engineering Extension Department, Iowa State College, Ames, Iowa.)

Survey of Neighborhood Playground Needs.—A summary of a survey made by the Playground and Recreation Department of Los Angeles to determine the number of neighborhood playgrounds needed. The conclusions, some of the data, and two of the map studies made, are included in the summary. 6 pp. (Apply to Playground and Recreation Commission, Los Angeles, Calif.)

Proceedings of the Governmental Research Conference, 1926.—An 80-page mimeographed report of the Conference held in Rochester on November 22 and 23, 1926, containing papers and discussions on street lighting, fund management, highway finance, fire protection, insurance on public property, and, apropos of the twentieth anniversary of the founding of the first bureau of municipal research, a concluding address by Dr. C. A. Beard on the past, present and future of government research. (Apply to Governmental Research Conference, 261 Broadway, New York.)

Ethics of the Secretary.—A 43-page pamphlet containing an address by Walter O. Lochner, President of the National Association of Commercial Organization Secretaries, presented at a meeting of the New England Association of Commercial Executives, at Springfield, Mass., January 15, 1927, and printed by the latter Association. It discusses various codes of ethics of allied professions, and their application to the commercial secretary, with an elaboration of the latter's obligations in various directions. (Apply to E. G. Kingsbury, Secretary-Treasurer of the N. E. A. C. E., Chamber of Commerce, Stamford, Conn.)

The Secretary.—A one-act play setting forth the tribulations of the Chamber of Commerce secretary, and the nature and merits of the work of both the secretary and his organization; it is designed to increase appreciation and support. It was written by the staff of the Lesan-Carr Advertising Agency of St. Petersburg, Fla., and was recently enacted by them before the local Chamber of Commerce. Through handling the publicity of many Florida communities the authors had been brought into close contact with chamber of commerce activities. Copies of the manuscript will be sent to any chamber of commerce secretary who may consider producing it, provided only that credit be given to the Lesan-Carr Agency as authors. (Apply to the Agency.)

The Power Situation in North Carolina.—Circular No. 16 of the North Carolina Department of Conservation and Development, representing a study through 1925 by the Water Resources Division. The growth and status of power production, both hydro-electric and steam, is gone into for North Carolina and neighboring states; water-power sources, estimates of potential power, uses of power, and interconnection are discussed. Engineering investigations of rainfall, stream flow, evaporation, silting and reforestation, with relation to hydro development, and of rural electrification, are recommended. 34 pp. (Apply to the Department, Chapel Hill, N. C.)

Report on the New Rate Schedule for The Grand Rapids Gas Light Company.—A blue-line-print report of 15 pages, including nine exhibits, made to the Mayor and City Commission of Grand Rapids, Mich., by Gerald J. Wagner, consulting electrical engineer of that city and Chicago, recommending the trial of the rates in question, which contemplate a change from a flat rate to a sliding scale, together with an increase in the minimum charge. Consumers of under 2,500 cubic feet per month will pay more and others less; a slight decrease in total revenue is estimated, on the basis of present use. Wholesale uses, both domestic and commercial, are expected to be encouraged. (Apply to Mr. Wagner.)

Fire-Station Views, Baton Rouge, La.—A strip of five post-card views of the central fire-station, the drill tower, and three very attractive residential type substations, of the Baton Rouge Fire Department, which issues this as a souvenir. (Apply to R. A. Bogan, Chief of the Department.)

Proceedings, North Carolina Section, American Water Works Association.—These are the proceedings of the sixth annual meeting and fourth Water Purification Conference, held at Wilmington, N. C., August 23, 1926. They appear in the *Journal* of the North Carolina Section (Vol. 4, No. 1). Topics of papers presented and discussed included street-lighting activities of water departments, and municipal ownership in the lighting field; deep-well piping; deforestation; algae; gridiron layouts; stream pollution; office systems; valves; and various aspects of water purification. 164 pp. (Apply to the Secretary, H. G. Baity, Chapel Hill, N. C.)

Ottawa Suburban Roads Commission—Annual Report of the Engineer, 1926.—A 22-page mimeographed report, with photographs, giving an outline of the year's work, a condensed financial statement, schedule of road construction, expenditures on construction and maintenance, mileage of road surfaces, unit costs of work completed, and a traffic census. (Apply to the Commission, Ottawa, Ontario, Canada.)

Prisoners: 1923.—A Bureau of the Census report on crime conditions in the United States as reflected in census statistics of imprisoned offenders. It gives facts descriptive of the prisoners, such as sex, age, race, nativity, marital condition, citizenship; and others of penological interest, including nature of offenses, sentences imposed, previous commitments, length of imprisonment, etc. 363 pp.; paper covers. 50 cents. (Apply to Superintendent of Documents, Washington, D. C.)

One of the EVERYDAY USES *of* MARBLE

Of Course, There Are Imitations, But—

IMITATIONS of marble—those manufactured products claimed to be "almost as good"—serve only to emphasize the matchless and incomparable standard of marble. All of them recognize marble as the ultimate.

Genuine marble is unmistakable—in its beauty, its gleaming depth of surface, its veining and coloring. It is alive . . . vibrant with vitality from Nature's own laboratories. And its ultimate cost is no more than the average lifeless imitation.

A series of illustrated folders detailing the advantages of marble in both public buildings and the home are yours for the asking. Write to Department E-11 for the ones that interest you—no obligation, of course.

NATIONAL ASSOCIATION *of* MARBLE DEALERS

ROCKEFELLER BUILDING · CLEVELAND · OHIO

There is No Substitute for Marble

The Cooperative Movement in Social Work.—By William J. Norton, Secretary of the Detroit Community Fund. The Macmillan Co., New York. 1927. XIII + 373 pp. $3.50.

The growth of social welfare work against the background of American individualism is sketched here; the earlier period, during which the gradual establishment of charity organizations developed into a multitude of overlapping agencies breeding confusion and inefficiency, being briefly described as an introduction to the spread of cooperative organizations—councils of social agencies, welfare federations, alliances of charities and philanthropies, community funds or chests—which, at the end of the first quarter of the present century, were to be found in some 250 communities in the United States and Canada, with interest becoming world-wide. The part played by city commercial organizations is brought out, and the influence of war chest campaigns is traced. It is made clear that the cooperative scheme is necessarily an expression of majority opinion rather than that of advanced minorities—at least as to economic reform. Among problems discussed are those of limitations as to what agencies are to be included; community budgeting; capital funds and community foundations; and public "education." The book is the fourth in The Social Welfare Library, edited by Dr. Edward T. Devine, who says of the author, "William J. Norton is by common consent the qualified spokesman for this cooperative movement in social work. He has written its authoritative manual."

The National Budget System.—By W. F. Willoughby, Director, Institute for Government Research. The Johns Hopkins Press, Baltimore, Md. 1927. XVI.+ 343 pp. $3.00.

The national budget having been in operation for more than five years, this book is an evaluation of the system in the light of that experience. The history of the budget movement in national affairs is traced; the organization of the Bureau of the Budget is described; the various steps in the formulation of the budget by the executive, its consideration by Congress, its execution, including the control exercised by Congress and the executive, are gone into in detail. The author maintains that our system presents advantages superior to those to be found in the budget system of any other country; but that, nevertheless, there are many details in respect to which the system as it exists to-day is susceptible of improvement. Some 70 pages of the book relate to suggestions as to such improvement. An appendix of 52 pages contains the text of the Act, executive orders, relevant rules of the House and Senate, an organization outline, and a bibliography.

The Municipal Year Book for 1927.—Edited by C. P. Bulpitt. The Municipal Journal, Ltd., Sardinia House, Sardinia Street, London, W.C. 2, England. 1927. 900 pp. 15 shillings.

This volume gives the make-up, including the chief personnel, of the local governments of the British Isles, together with statistics such as population, area, taxes, valuations, and debt, and textual information about municipal activities, all as related to the beginning of 1927; and is also to some extent a review of the year 1926. To each of various sections into which the book is divided there is an introductory chapter explaining the powers and duties of the different classes of authorities. Financial results of the many municipal utility undertakings are given. Comparative costs and other statistics on education; information relating to highway administration and extensions; the status of recreational provisions; a statement of the housing and town planning situation, with a variety of statistical information; data on refuse collection and disposal, street cleaning, and sewage disposal; and a list of municipal societies and their officers, are other leading features of this excellent compilation.

Standard Fire Tests.—An address by Wharton Clay, Commissioner, Associated Metal Lath Manufacturers, presented at the Building Officials Conference at Chicago, in April of this year. It sketches the development of fire tests and gives their practical application, the actual fire observations, and various warnings and conclusions concerning them. 19 pp., mimeographed. (Apply to Mr. Clay, 123 West Madison Street, Chicago, Ill.)

What Our City Councils Are Doing.—Lists No. 16 and 17 of Ordinances Introduced in or Passed by the City Councils of Large Cities. November 1, 1926, and January 8, 1927. 3 and 4 mimeographed sheets. (Apply to Frederick Rex, Municipal Reference Librarian, 1005 City Hall, Chicago, Ill.)

Public Utility Finance.—By Walter E. Lagerquist, Counsellor on Investments, American Exchange Irving Trust Co., New York. A. W. Shaw Co., Chicago and New York. 1927. XIX + 671 pp. $7.50.

This is the first volume in the series of Materials for the Study of Public Utilities, of the Institute for Research in Land Economics and Public Utilities, Richard T. Ely being the editor-in-chief of the series and Herbert B. Dorau the managing editor. The editors observe that the literature of public utility economics is at this time largely in the form of pamphlet, magazine article, or reprint; and the series which this volume begins is designed to provide a comprehensive collection of these materials in such form that it can be turned to conveniently and quickly by executive, research worker, or student. Depending on the reception accorded to the first volumes, the series is planned to include public utility economics, regulation, finance, labor, accounting, operation, management, and rate-making. Any organized and comprehensive treatment of the public utility field is sure to draw criticism, and the Institute has not escaped attack, made on the score of its conservative leanings. The present volume draws heavily, as is natural enough, from the writings of utility company executives and counsel, committees of utility and banking associations, utility trade journals, and bankers and financial writers. Articles by a few men representative of the broader public viewpoint are included; but there is little recognition or presentation of the ideas of Professor W. Z. Ripley or of more unorthodox students of public utility finance. Despite these limitations, the book should prove a useful addition in its field.

Main Street and Wall Street.—By William Z. Ripley, Harvard University. Little, Brown Company, Boston. 1927. VII + 359 pp. $2.50.

In this book Professor Ripley takes up various problems of corporate organization and control incident to the great increase of popular investment, particularly in corporations performing public services. In his inimitable style, embellished with genial wit, he deftly and at times devastatingly turns over his subject, with results that have already been far-reaching. The book deals largely with public utilities, especially electric light and power, and is therefore important in the municipal field.

Fire Hazards; Cooperation; Fire Streams.—Three papers presented at the Second Short Course for Fire Fighters, at Ames, Iowa, October 26-29, 1926. "Fire Hazards in Iowa," and "Community and Fire Department Cooperation," are by J. A. Tracy, State Fire Marshal, and together constitute Iowa State College Official Publication No. 22 of Vol. XXV, dated Oct. 27, 1926, and also Bulletin 87 of the Engineering Extension Department. "Characteristics of Fire Streams," by Harry J. Corcoran, Chief Engineer, Iowa Insurance Service Bureau, Des Moines, is Official Publication No. 30 of Vol. XXV, dated Dec. 22, 1926, and Bulletin 85 of the Engineering Extension Department. 7 and 10 pp., respectively. (Apply to Engineering Extension Department, Iowa State College, Ames, Iowa.)

Proceedings of the Massachusetts Tree Wardens' and Foresters' Association.—The sixteenth annual meeting of the Association, here reported, was held in Boston, January 19, 1927. The Proceedings, a 29-page pamphlet, includes reports of officers and committees, and talks on roadsides, landscaping state highways, and pruning. (Apply to Secretary-Treasurer of the Association, City Hall, Salem, Mass.)

Tax Rates in Minnesota for 1927.—A ten-page table in the April number of *Minnesota Municipalities*, giving, for 725 cities, villages and boroughs, the valuations and tax rates, dividing the latter into municipal, township, county, school and state. 25 cents. (Apply to League of Minnesota Municipalities, University Library, Minneapolis.)

Child Health Demonstrations.—The Child Health Demonstration Committee, 370 Seventh Avenue, New York, is conducting activities in four different parts of the country, to show the effect of planning and integration in health work for children. That in Fargo, N. Dak., was begun in January, 1923, and was followed the next year by Athens, Ga., and Rutherford County, Tenn., and in 1925 by the demonstration in Marion County, Ore. Three bulletins bearing on these activities have been issued by the Committee: No. 1, The Child Health Demonstrations—Programs and Policies (16 pp.); No. 2, Child Health in Marion County, Oregon (19 pp.); and No. 3, Cooperation for Child Health in Athens, Georgia (16 pp.). The first two are dated February, 1927, and the third, March, 1927. (Apply to the Committee.)

More Power!

MORE traction, extra weight, faster speeds, simpler, sturdier construction, *now* are all first combined in the New 6-ton Monarch! 40 H. P. at the draw bar assured by its valve-in-head motor. The *size*, the *capacity*, the *quality* which experienced road builders have long wanted; now Monarch is the first to meet that demand.

Power to pull a 10-foot grader or similar road machine to full capacity under extreme conditions, and at the most practical speeds. Power to do *more* work than "5-ton" or other medium sizes can do. The *extra pull* which saves time and makes real money on every job of grading, maintainence, contracting, snow removal or hauling.

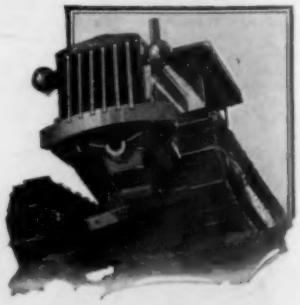
Exceptional track area enables it to *keep traction* and to pull evenly; its track links of one-piece drop forged steel—the greatest advance ever made in the industry—provide maximum mileage and economy. Perfect balance and distribution of weight, perfect oscillation of tracks on roughest soils and over obstructions, automobile-ease of steering, combined with the Monarch efficient chain drive.

See this new, most modern power unit. Study its specifications and compare it in every detail with other types. Our distributors will gladly give you full information, and arrange a most convincing demonstration of *power*, *accessibility* and *economy*.

MONARCH TRACTORS CORPORATION
Springfield, Ill., U. S. A.

A NEW SIZE

Motor 4 cyls. 5⅛"x6½". 1000 RPM.
60 brake, 40 draw bar H. P.
Speeds 1.86, 2.82, 4.07; 3.26 M. P. H.
New Departure ball bearings in transmission.
Multiple disc steering clutches, completely accessible.
One-piece drop forged steel truck wheels; reservoirs hold two weeks' oil supply.
All track sprockets ring type; chain sprockets cut steel.
Electric starting and lighting equipment.



6-Ton Monarch Tractor

Do you mention THE AMERICAN CITY when writing? Please do.

A Short Course in American Civics.—By A. G. Fradenburgh, Ph D., Professor of History and Politics, Adelphi College, Brooklyn, N. Y. Noble and Noble, New York. 1926. XIII + 287 pp. Illustrated. $1.35.

This is a new and revised edition of the author's textbook which was copyrighted in 1919, and is intended for pupils in the last elementary grade or the first year in high school. The greater part is concerned with the national government. There are two short chapters on local rural government, somewhat more space (35 pp.) on city government, and three chapters on state government. Special attention is given to New York, both city and state. The city manager plan is barely mentioned. The general treatment of topics is, of course, elementary, but this quality is not carried to an extreme. There are a few instances where the assumption as to amount of general information on the part of the children may be rather great, while on the other hand some of the statements seem unduly naive. On the whole, considering the difficulty of selecting and presenting the material for the grades in question, the book may be regarded as a satisfactory, useful text, with a high civic spirit.

The Bureau of Educational Counsel.—A Student Personnel Department of the LaSalle-Peru Township High School and LaSalle-Peru-Oglesby Junior College. History and description of a personnel program, with mental hygiene approach, attention to individual students, and emphasis on superior students. Report for 1923-1926. 52 pp. (Send 5 cents postage to the Bureau, LaSalle-Peru Township High School, LaSalle, Ill.)

Revised Ordinances of the City of Bismarck, N. Dak.—Prepared by C. L. Young, City Attorney, and M. H. Atkinson, City Auditor. 1926. III + 234 pp. The first charter of the city of Bismarck was granted in 1875. The city ordinances were not revised or codified between 1885 and 1926. Since 1885 more than 300 new ordinances have been enacted and many earlier provisions of the law have thereby been repealed. The large divisions of the present city code are: Administration; Public Works; Public Utilities; Building Regulations; Health and Sanitation; Public Welfare; City Planning; Business and Trades; Public Morals; Public Safety; Weights and Measures. (Apply to City Clerk, Bismarck, N. Dak.)

Does the Uniform Small Loan Law Curb the Loan Shark?—Published by the Kansas City Committee on the Loan Shark Problem, Kansas City, Mo. February, 1927. This committee is urging the adoption by the Missouri General Assembly of a bill based on the Uniform Small Loan Law, which was drafted by the Russell Sage Foundation and is now on the statute books of 23 states. 8 quarto pp. Besides a general discussion of the loan shark system and an explanation of the Uniform Small Loan Law, this pamphlet gives comments from state officials who administer the Law and from agencies of various kinds which come in close contact with the loan shark system in 31 different cities in states which have the Uniform Law. (Apply to the Committee.)

A Plan for a Unified Transportation System for The City of Chicago.—This is a plan submitted to the Mayor and City Council of Chicago by Henry A. Blair, head of the Chicago Surface Lines, and covers subway, elevated, surface railway and bus transportation under one control. Tables, illustrations, subway sectional plans, and maps. January, 1927. 32 pp. + 3 folded maps. (Apply to Mr. Blair.)

Ordinances for Terminable Permits for Surface and Elevated Railways in the City of Chicago.—Drafts of two ordinances for granting terminable permits, one for the operation of a system of street surface transportation, and the other for the operation of a system of elevated railways for rapid transit, submitted in April and June, 1926, respectively, by the Corporation Counsel to the Committee on Local Transportation of the Chicago City Council. 145 and 119 pages, respectively. 10 cents each, for postage. (Apply to Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

Papers and Reports on Civil Service Reform.—Printed copies, preliminary to the complete proceedings, of two reports and two addresses presented at the joint annual meeting, on May 11, of the National Civil Service Reform League and the New York Civil Service Reform Association, being the fiftieth anniversary of the founding of the latter. They include the annual report of the Executive Committee of the Association; the report of the Council of the League; and addresses by Thomas W. Swan, retiring President of the League, and by Hon. Wm. Drennan, of the New York City Civil Service Commission. (Apply to the League, 8 West 40th Street, New York.)

The Preparation and Revision of Local Building Codes.—A pamphlet by George N. Thompson, Secretary, Building Code Committee, United States Department of Commerce. A discussion that calls attention to the importance of scientific building code requirements and of logical arrangement, supplies major sources of information, and indicates some of the modern developments in use of materials as reflected in recent codes. 13 pp. 25 cents. (Apply to Municipal Administration Service, 261 Broadway, New York.)

Industrial Surveys.—The Industrial Development Committee of the Illinois Chamber of Commerce has prepared a comprehensive outline of the subjects to be investigated and the information to be secured in making an industrial survey of a city, and recommends it for this purpose to chambers of commerce. It has been very useful in surveys in many Illinois cities. 11 pp., mimeographed. (Apply to C. L. Hardin, Industrial Secretary, Illinois Chamber of Commerce, 35 East Wacker Drive, Chicago, Ill.)

Is the Skyscraper a Public Nuisance?—An article in the May number of *The World's Work*, by Henry James, Consultant on Special Problems, Committee on Regional Plan of New York and Its Environs. In 11 pages, containing many photographs and architects' drawings, the author gives a summary of the development of skyscrapers and, more particularly, of the controversy centering about them. (Apply to Doubleday, Page & Company, Garden City, N. Y.)

An Eight-Year Financial Program for Detroit.—The report of the Mayor's Committee on Finances, under date of February 25, 1927, bringing up to date the report of May 19, 1925, setting forth a ten-year program by the same committee, less four members who were subsequently added. Published as the April 15 number of *Public Business*, by the Detroit Bureau of Governmental Research, Inc. 75 pp. (Apply to the Bureau, 316 East Jefferson Avenue, Detroit, Mich.)

A Plea for the Enumeration of Cities Every Five Years.—The inaccuracies of population estimates are pointed out, and an actual enumeration at least twice as often as the Federal Census is urged by C. C. Pashby, City Clerk of Memphis, Tenn., in a brief article in *The Comptroller* for May. (Apply to Mark M. Foote, Editor, care Comptroller's Office, Chicago, Ill.)

Landscape Development of School Grounds; The Guyton School Garden.—The first topic given is the subject of an editorial, and the second is that of a short illustrated article by Katherine Banning, Nature Study Instructor, Guyton School, in the May issue of *The Detroit Educational Bulletin*. (Apply to Board of Education, Detroit, Mich.)

An Outline of Sewage Purification Studies at the Lawrence Experiment Station.—A reprint of an article from *Industrial and Engineering Chemistry* for April, by H. W. Clark, Chief Chemist of the Massachusetts Department of Public Health, and Director of the Lawrence Experiment Station since 1895, who gives an authoritative brief description of the work that has been done by the station, which has been visited by specialists in the purification and treatment of sewage and water, from all over the world, and with which Mr. Clark has been connected since its inception more than 38 years ago. 13 pp. (Apply to the author, Lawrence Experiment Station, Lawrence, Mass.)

The Next Ten Years in Kansas City's Municipal Finance.—Some basic considerations, on the part of the Kansas City Public Service Institute, looking toward a ten-year financial and improvement program for Kansas City, Mo. Operating requirements, debt, special assessments, and improvement requirements are gone into. March, 1927. 27 pp., mimeographed. (Apply to the Institute, 501 Orear-Leslie Building, Kansas City, Mo.)

The Problem of Poor-Relief Administration in Municipalities.—A 6-page article in the *Virginia Municipal Review* for April, by Arthur W. Jones, Special Agent, State Board of Public Welfare of Virginia. It includes a summary of answers to a questionnaire sent by the author to mayors and city managers of Virginia cities. 25 cents. (Apply to Review Publishing Company, 409 Travelers Building, Richmond, Va.)

Milk for Health and Wealth.—A discussion of the proper methods of milk production as required by the milk ordinance of the city of Nacogdoches, Texas, by R. G. Upton, Professor of Bacteriology at Stephen F. Austin State Teachers College. It is in the form of a catechism, followed by the text of the ordinance. 23 pp. (Apply to R. C. Monk, City Secretary, Nacogdoches, Texas.)

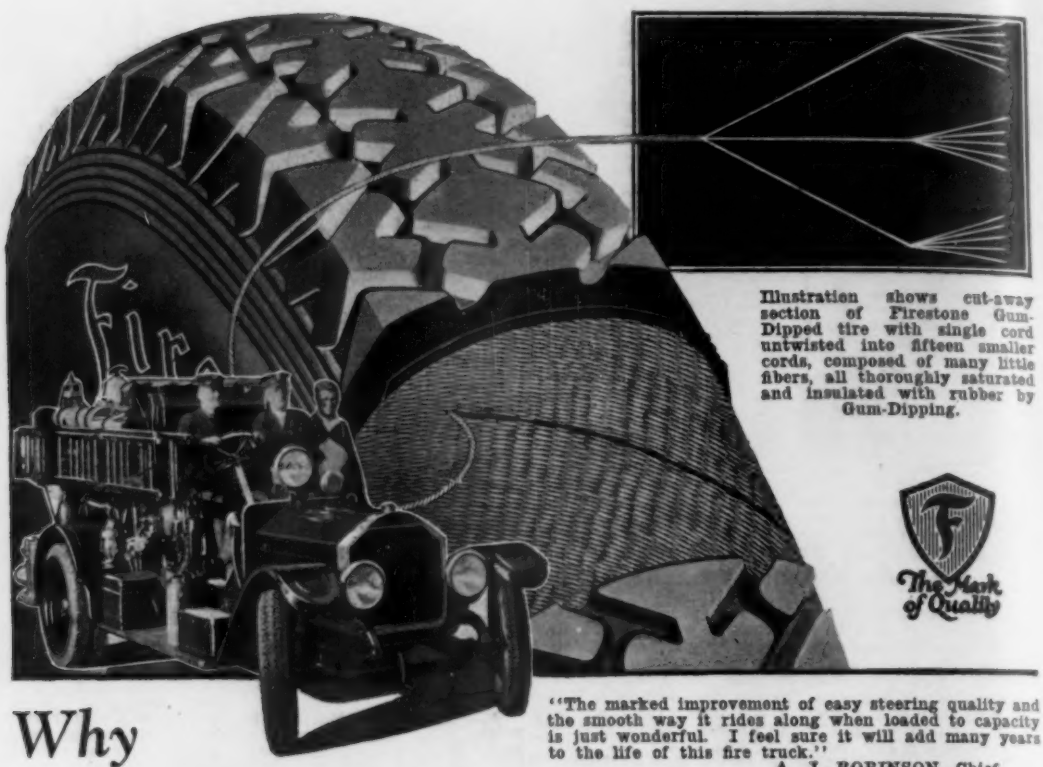


Illustration shows cut-away section of Firestone Gum-Dipped tire with single cord untwisted into fifteen smaller cords, composed of many little fibers, all thoroughly saturated and insulated with rubber by Gum-Dipping.

The Mark of Quality

"The marked improvement of easy steering quality and the smooth way it rides along when loaded to capacity is just wonderful. I feel sure it will add many years to the life of this fire truck."

A. J. ROBINSON, Chief.
Clinton, Mass.

Why

Firestone

Dips the Cords of the Carcass in a Rubber Solution

In the old Fabric Tire, internal friction was excessive and mileage low, due to the square-woven construction of the fabric being impossible to insulate with rubber.

Then came the Cord Tire, with cords in each ply laid parallel—no interwoven cross-threads—permitting much greater insulation of the cords, one from another. This materially reduced friction and more than doubled tire mileage. But the small cords were not insulated with rubber and destructive friction within the cord was not overcome. After much research Firestone chemists found a method of insulating every fiber of every word with rubber and called it "Gum-Dipping." By this process the cords of the carcass are dipped in a rubber solution which penetrates to the innermost fibers, protecting Firestone Tires from the fatigue of high-speed driving.

Call on the Firestone Dealer today. Let him save you money and serve you better.

MORE MILES PER DOLLAR

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER . . Harvey S. Firestone

Measuring the Efficiency of a City's Government.—A reprint of 15 articles by Louis P. Head which appeared in the *Dallas News*, January 7 to February 11, 1927, in which the criteria on city government as formulated by William B. Munro of Harvard University are applied to Dallas. 56 pp. (Apply to the *Dallas News*.)

Crime in Detroit, 1916-1926.—The March 1 issue of *Public Business*, published by the Detroit Bureau of Governmental Research, contains a chart showing graphically the number per 1,000 population of complaints of major felonies for each month of the 11 years indicated. The absolute figures are also given; and there is a summary of proposals of the Commission of Inquiry into Criminal Procedure, of the Michigan State Legislature. (Apply to the Bureau, 316 East Jefferson Avenue, Detroit.)

The Forest Protection Conference.—A 77-page booklet made up of the papers presented at the conference called by the New York State College of Forestry, Syracuse University, Syracuse, N. Y., November 10-12, 1926. (Apply to the College.)

Tournament of Roses, Pasadena, Calif.—A profusely illustrated account of this annual event, held on New Year's Day. It is in the form of a 68-page booklet issued as the January 1, 1927, number of the *Pasadena Evening Post*. Various permanent attractions of Pasadena are also featured. (Apply to the *Evening Post*.)

Report on Municipal Sanitary Engineering Practice in Great Britain.—Public Health Bulletin No. 166, United States Public Health Service, by H. W. Streeter, Sanitary Engineer in the Service, recording and summarizing observations made by the author while participating in an interchange of sanitary engineers held in Great Britain under the joint auspices of the League of Nations and the British Ministry of Health, June 21 to July 21, 1926, supplemented by visits made to selected English cities by official order of the United States Public Health Service. 56 pp., illustrated. 15 cents. (Apply to Government Printing Office, Washington, D. C.)

Reports Received

BALTIMORE, MD.—Annual Report, Free Public Bath Commission, 1926.
CAMBRIDGE, MASS.—Annual Report, Water Board, year ending March 31, 1926
CHICAGO, ILL.—Annual Report, Bureau of Recreation, Board of Education, 1926.
FREDERICKSBURG, VA.—Annual report of city, 1926.
HAYS, KANS.—Annual Report, City Manager, 1926.
LAPRAIRIE, QUEBEC.—Rapport Financier, 1926.
LITCHFIELD, MINN.—Annual Report, Municipal Light, Power, Heating and Water Plant, to April 4, 1927.
OGDEN, UTAH.—Annual Report, Auditor, 1926.
STAUNTON, VA.—Annual Report, to March 31, 1927.
TAUNTON, MASS.—Annual Report, Water Commissioners, 1926.

Conventions This Month

JUNE 4-6.—CHICAGO, ILL.
Conference of State Sanitary Engineers. Annual meeting. Secretary, Arthur B. Miller, 3 B Street S.E., Washington, D. C.

JUNE 6-7.—EAU CLAIRE, WIS.
Wisconsin Association of Commercial Secretaries. Annual meeting. Secretary, Lee I. Yorkson, Wausau, Wis.

JUNE 6-8.—TULSA, OKLA.
American Association of Engineers. Annual convention. Acting Secretary, Miss M. E. McIver, 63 East Adams Street, Chicago, Ill.

JUNE 6-9.—WINDSOR, ONT.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

JUNE 6-10.—ATLANTIC CITY, N. J.
National Electric Light Association. Annual convention and exhibition. Secretary, A. Jackson Marshall, 29 West 39 Street, New York.

JUNE 6-11.—CHICAGO, ILL.
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 170 Broadway, New York.

JUNE 7.—OTTAWA, ONT.
National Association of Comptrollers and Accounting Officers. Annual convention. Secretary, Mark M. Foote, 501 City Hall, Chicago, Ill.

JUNE 7-9.—OTTAWA, ONT.
Union of Canadian Municipalities. Annual convention. Secretary, S. Baker, City Clerk, London, Ont.

JUNE 10-11.—PORTLAND, ME.
New England Association of Commercial Executives. Annual meeting. Secretary, E. G. Kingsbury, Chamber of Commerce, Stamford, Conn.

JUNE 10-11.—ALLENTOWN, PA.
Pennsylvania Commercial Secretaries Association. Secretary-Treasurer, E. A. Hirschman, Chamber of Commerce, York, Pa.

WEEK OF JUNE 13.—TORONTO, ONT.
Canadian Public Health Association. Annual meeting. General Secretary, J. T. Phair, Spadina House, Toronto, Ont.

WEEK OF JUNE 13.—ON BOARD S. S. "KINGSTON," VISITING HAMILTON, NIAGARA FALLS, TORONTO, AND ROCHESTER, N. Y.
Union of the Municipalities of the Province of Quebec. Annual convention. Secretary-Treasurer, T. D. Bouchard, 120 Rue St. Jacques, Montreal, Que.

JUNE 14-16.—MINNEAPOLIS, MINN.
League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, University of Minnesota Library, Minneapolis, Minn.

JUNE 15-17.—SHEBOYGAN, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Ford H. McGregor, Madison, Wis.

JUNE 16-17.—PHILADELPHIA, PA.
American Automobile Association. Annual meeting. General Manager, Ernest L. Smith, Pennsylvania Avenue at 17 Street, Washington, D. C.

JUNE 20-24.—DETROIT, MICH.
American Institute of Electrical Engineers. Summer convention. Secretary, F. L. Hutchinson, 33 West 39th Street, New York.

JUNE 20-24.—FRENCH LICK, IND.
American Society for Testing Materials. Annual meeting. Secretary, C. L. Warwick, 1315 Spruce Street, Philadelphia, Pa.

JUNE 20-25.—PARIS, FRANCE.
International Congress of Administrative Sciences. Third meeting. Address: Professor Leonard D. White, University of Chicago, Chicago, Ill.

JUNE 20-27.—TORONTO, ONT.
American Library Association. Annual convention. Executive Secretary, Carl H. Milam, 86 East Randolph Street, Chicago, Ill.

JUNE 21-23.—PORTLAND, ME.
New England Association of Fire Chiefs. Annual convention. Secretary, Chief John W. O'Hearn, Watertown, Mass.

JUNE 22.—EVERETT, WASH.
Washington Association of Commercial Organization Secretaries. Annual meeting. Secretary, G. M. Hafenbrack, Longview, Wash.

JUNE 22-24.—CLEVELAND, OHIO.
American Association of Nurserymen. Annual convention. Executive Secretary, Charles Sizemore, P. O. Box 369, Louisiana, Mo.

JUNE 23-25.—FORT WORTH, TEXAS.
Association of Chiefs of Police and City Marshals of Texas. Annual convention. Secretary, George A. Smith, P. O. Box 299, Dallas, Texas.

JUNE 23-25.—SHERMAN, TEXAS.
Texas Commercial Executives Association. Annual Conference-school. Secretary, Maury Hopkins, Plainview, Texas.

JUNE 24-25.—ITHACA, N. Y.
New York State Secretaries Conference. Annual meeting. Secretary, Ralph C. Smith, Savings Bank Building, Ithaca, N. Y.

JUNE 26-30.—DENVER, COLO.
American Community Advertising Association. Annual meeting. Secretary-Treasurer, Don E. Mowry, 401 Cantwell Building, Madison, Wis.

JUNE 27-JULY 2.—STOCKHOLM, SWEDEN.
International Chamber of Commerce. Fourth general meeting. Secretary, Lacey C. Zapf, 1615 H Street, Washington, D. C.

(For future convention dates, see page 867)

for Economical Transportation

CHEVROLET

Specially fitted for the Requirements of Municipalities

—at these Low Prices!

1-Ton Truck with Stake Body	$680
1-Ton Truck with Panel Body	$755
1-Ton Truck Chassis with Cab	$610
1-Ton Truck Chassis	$495
½-Ton Truck Chassis	$395

All prices f. o. b. Flint, Mich.

Check Chevrolet Delivered Prices

They include the lowest handling and financing charges available.

Powered by a motor that is famous the world over for its remarkable performance and operating economy, and offering the most advanced modern design in every feature of the chassis—Chevrolet has revolutionized every idea of how fine a truck you can buy for little money.

Municipalities in every section of the country are turning to Chevrolet in increasing numbers—for never before has any low-priced truck so admirably met the requirements of public construction work.

Sturdy and durable, Chevrolet provides a performance of astonishing dependability under every condition of road and load.

And Chevrolet economy, based on low first cost, low operating cost and the very minimum of upkeep expense—has long been traditional wherever trucks are used.

There is a wide range of body types available for almost any purpose.

See your nearest Chevrolet dealer. He will gladly arrange a trial load demonstration under your own delivery or haulage conditions.

CHEVROLET MOTOR COMPANY, DETROIT, MICHIGAN

Division of General Motors Corporation

The WORLD'S LARGEST BUILDER OF GEAR-SHIFT TRUCKS

Do you mention THE AMERICAN CITY when writing? Please do.

Conventions—When and Where

(For June conventions, see page 865)

JULY 3-8.—SEATTLE, WASH.
National Education Association of the United States. Annual meeting. Secretary, J. W. Crabtree, 1201 16th Street, Washington, D. C.

JULY 13-15.—DENVER, COLO.
American Society of Civil Engineers. Annual convention. Secretary, George T. Seabury, 33 West 39th Street, New York; Secretary City Planning Division, Charles B. Ball, 4227 N. Ashland Avenue, Chicago, Ill.

JULY 17-23.—PALO ALTO, CALIF.
Western School for Commercial Secretaries. Address: Professor Edwin A. Cottrell, Stanford University, Palo Alto, Calif.

JULY 26-28.—ALTOONA, PA.
Pennsylvania Chiefs of Police Association. Secretary-Treasurer, J. N. Tillard, Chief of Police, Altoona, Pa.

AUGUST 9-12.—PORTLAND, ORE.
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahy, Yonkers, N. Y.

AUGUST 10-13.—SEATTLE, WASH.
National Association of Real Estate Boards. Annual convention. Executive Secretary, Herbert U. Nelson, 310 South Michigan Avenue, Chicago, Ill.

AUGUST 13-14.—TORONTO, ONT.
Canadian Tax Conference of Citizens Research Institute of Canada. Annual convention. Director, Horace L. Brittain, 21 King Street, East, Toronto, Ont.

AUGUST 16-19.—SALT LAKE CITY, UTAH.
International Association of Municipal Electricians. Annual convention. Secretary, Erwin H. Bentz, Municipal Building, West New York, N. J.; Chairman of Exhibit Committee, Daniel J. Morgan, Sales Engineer, Hazard Manufacturing Company, Wilkes-Barre, Pa.

AUGUST 22-SEPTEMBER 3.—EVANSTON, ILL.
National School for Commercial and Trade Organization Executives. Address: Hugh Lynch, Merchants' Association, Woodworth Building, New York, or John N. Van der Vries, Chamber of Commerce of the United States, 801 Otis Building, Chicago, Ill.

AUGUST 22-25.—WILKES-BARRE, PA.
League of Cities of the Third Class in Pennsylvania. Annual convention. Secretary, Fred Gates, City Clerk, Wilkes-Barre, Pa.

AUGUST 31-SEPTEMBER 2.—TORONTO, ONT.
Ontario Municipal Association. Convention. Secretary, Horace L. Brittain, 21 King Street, Toronto, Ont.

SEPTEMBER.—PHILADELPHIA, PA.
American Institute of Park Executives. Annual convention. Executive Secretary, Will O. Doolittle, Box 422, Tulsa, Okla.

SEPTEMBER.—BOSTON, MASS. (Tentative.)
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 12-14.—VANCUOVER, B. C.
Canadian Chamber of Commerce. Annual convention. Secretary General, W. McL. Clarke, Board of Trade Building, Montreal, Que.

SEPTEMBER 13-15.—DUBUQUE, IOWA.
International City Managers' Association. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

SEPTEMBER 26-30.—CHICAGO, ILL.
National Safety Council. Annual Safety Congress. Managing Director, W. H. Cameron, 108 East Ohio Street, Chicago, Ill.

SEPTEMBER 27-29.—NIAGARA FALLS, ONT.
Canadian Good Roads Association. Annual convention. Secretary, George A. McNamee, New Birks Building, Montreal, Que.

OCTOBER 3.—DENVER, COLO.
American Association of State Highway Officials. Annual convention. Executive Secretary, W. C. Markham, 638 Munsey Building, Washington, D. C.

OCTOBER 3-7.—MEMPHIS, TENN.
Playground and Recreation Association of America. Annual convention. Secretary, H. S. Braucher, 315 Fourth Avenue, New York.

OCTOBER 11-14.—CHICAGO, ILL.
Illuminating Engineering Society. Annual convention. General Secretary, L. H. Graves, 29 West 39 Street, New York.

OCTOBER 17-21.—CINCINNATI, OHIO.
American Public Health Association. Annual meeting. Secretary, Homer N. Calver, 370 Seventh Avenue, New York.

OCTOBER 23-26.—COLUMBUS, OHIO.
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, Clarence R. Miles, Chamber of Commerce, Davenport, Iowa.

NOVEMBER 10-11.—ST. LOUIS, MO.
National Municipal League. Annual convention. Secretary, H. W. Dodds, 261 Broadway, New York.

NOVEMBER 14-18.—DALLAS, TEXAS.
American Society for Municipal Improvements. Annual convention. Address: E. A. Kingsley, City Engineer, Dallas, Texas, Chairman Convention Arrangements Committee.

WEEK OF NOVEMBER 28, 1927.—ATLANTA, GA.
Asphalt Association. Annual Asphalt Paving Conference. Secretary, J. E. Pennybacker, 441 Lexington Avenue, New York.

JANUARY 9-13, 1928.—CLEVELAND, OHIO.
American Road Builders Association. Annual convention and Road Show. Secretary, Ethel A. Birchland, Earle Building, Washington, D. C.

JANUARY, 1928.—CHICAGO, ILL.
International Association of Street Sanitation Officials. Secretary, A. M. Anderson, 10 South LaSalle Street, Chicago, Ill.

FEBRUARY 21-24, 1928.—WICHITA, KANS.
Southwest Road Show and School. Under auspices Wichita Thresher and Tractor Club, Exposition Building, Wichita, Kans.

Increased Parking Difficulties Help Street Railway's Traffic

IN a report rendered to City Manager Fred H. Locke by Gerald J. Wagner, Consulting Electrical Engineer, covering the activities of the Utilities Department of Grand Rapids, Mich., for the year ending March 31, 1927, Mr. Wagner says with reference to the Grand Rapids Railway Co.:

"The company carried an increase of 1.65 per cent more passengers in 1926 than in 1925, which is much better than the constant decrease of former years. I think the chances for further improvement also are good, for the following reasons:

"1. The public is slowly realizing the fact that downtown streets are too expensive to be used as wholesale storage places for cars. The result is that eliminating parking in the downtown section except for very short periods of time is becoming less difficult. This is resulting in the greater use of street cars by people who formerly drove their autos downtown and left them parked on the street, and in a consistent increase in the construction of ramp garages or the use of privately owned parking places.

"2. When the increase of the use of automobiles brought about severe traffic congestion, the first move on the part of the public was to ask for wider streets to relieve this congestion. Gradually, however, as time goes on and the public is acquainted with the cost of widenings, it becomes a difficult thing to widen any streets except in the most urgent cases. In the future, no doubt, every city will be forced to resort to this means to a greater or less extent in order to relieve congestion, but experience has already shown that these widenings cannot be forthcoming as fast as the auto congestion increases.

"The result is that as the various issues mentioned above begin to be clarified, the street railway is more and more coming to be recognized as a very important means of relieving the traffic congestion in our downtown streets."

New International Chain-Drive Truck with All-Steel Cab

More Wabash Efficiency

THE Wabash Railroad is writing a new and important chapter into its record of freight handling in Chicago through the use of motor units.

The International Chain-Drive Truck, illustrated, and a battery of all-steel semi-trailers form a part of the new facilities which are correlating and speeding up freight movement to and from the main Polk Street Station, the 47th Street Transfer, and the Englewood Station, to an extent that has proved a revelation to the railroad and to shippers

The unhindered operation of this equipment means more efficient routing of in and out freight traffic from local industries and from foreign lines. Shipments are sent on their way 24 to 72 hours earlier and hundreds of trap cars and line cars are replaced monthly by these compact, flexible units, with consequent savings all along the line.

The International Truck is operated for the Wabash by the Arthur Dixon Transfer Company whose history in Chicago transportation goes back to 1863. They know hauling and they know the qualities of this International—the new chain-drive Model 74-C, specially designed for heavy hauling, dump work, trailer service, etc.

The Wabash has used International Trucks at many points in many capacities for years, and so have over two score of the country's best-known railroads. Internationals fill the bill—a better and more complete line today than ever. Sizes include the ¾-ton "Special Delivery"; 4 and 6-cylinder Speed Trucks, 1¼, 1½, and 2-ton; and heavy-duty trucks up to 5-ton. Also Motor Coaches, and the McCormick-Deering Industrial Tractor.

INTERNATIONAL HARVESTER COMPANY
of America
606 So. Michigan Ave. *(Incorporated)* **Chicago, Ill.**

INTERNATIONAL HARVESTER COMPANY TRUCKS

Do you mention THE AMERICAN CITY when writing? Please do.

News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

City Uses Two Elevated Tanks in Water System

A 100,000-gallon elevated tank was included in the Cuyahoga Falls, Ohio, water-works improvements in 1901. At that time Cuyahoga Falls was a village of approximately 3,500 people. The tank, which is located on the east side of the Cuyahoga River about half a mile from the water plant and a third of a mile from the business district, is still in service.

This municipality has enjoyed a very healthy growth in the meantime. In 1920, the old supply proved inadequate to supply the needs. Fortunately, an excellent supply was discovered about 1½ miles from the business district and on the same side of the river as the elevated tank.

NEW HALF-MILLION-GALLON ELEVATED STORAGE TANK AT CUYAHOGA FALLS, OHIO

The new source and the existing distribution system solved the city's water problem until recently, when an extraordinary growth occurred in the southwest part of the city, boosting the population to nearly 15,000. This new section, which is about a mile from the business district and 2½ or 3 miles from the water plant, made it necessary to provide elevated storage on the west side of the city. The half-million-gallon Horton elevated tank, which was made by the Chicago Bridge and Iron Works, 37 West Van Buren Street, Chicago, Ill., and which is illustrated, was installed in this locality to take care of peak loads. L. F. Cook, Superintendent of the City Light and Water Department of Cuyahoga Falls, gives a good description of the manner in which these tanks are used:

"The two elevated tanks are installed so that the elevation of the tank bottom is the same as the old. A pressure increase was not expected or desired, as the pressure in this new section averaged 50 pounds. The new tank, however, does give a greater volume of water, that can be drawn on during any peak which may occur in the west part of the city. There is another great advantage in having this amount of water storage. It is possible to shut the plant equipment down entirely for a considerably longer period. This lowers the power cost, as demand charges on the purchase of power from the electric light plant may be lowered during the time that the peak may be on the electric light system. Also, the pumping-plant need not be operated at an excessive rate, as the two tanks on the system very nicely take care of peak loads. On the after-midnight hours the pumps may be operated at a higher rate than previously, as the tanks provide a place in which to store water to take care of peak demands during the day. This is a considerable advantage."

Historic Testing Laboratory Burned

Early Saturday morning, April 9, fire totally destroyed the historic Westport Mill and Testing Laboratories of the Dorr Company, 247 Park Avenue, New York, on the banks of the Saugatuck River at Westport, Conn. The origin of the fire is unknown. The mill dates back to Revolutionary days, when it was operated as a cotton mill. When cotton spinning waned in this vicinity, the mill was converted into a grist mill and furnished buckwheat flour as far as New York City.

After some years of inactivity, the mill, with about 35 acres of land, was purchased by J. V. N. Dorr and used by the Dorr Company as a testing plant and laboratory. The old water-wheel continued in use, driving generators which furnished

New Engine!

GRAHAM BROTHERS TRUCKS

This is the finest engine ever used in Graham Brothers Trucks and Commercial Cars . . . Every advanced engineering feature that is proven.

See this new engine! . . . See it today! . . . Compare it with *any* engine *ever* built into *any* truck!

$670 ¾-TON

$885 1-TON

$1245 1½-TON

$1445 2-TON

Chassis prices, f. o. b. Detroit

GRAHAM BROTHERS

EVANSVILLE – DETROIT – STOCKTON

A DIVISION OF DODGE BROTHERS, INC.

GRAHAM BROTHERS (CANADA) LIMITED, TORONTO, ONTARIO

MORE POWER — MORE SPEED

FASTER ACCELERATION

MORE ECONOMY — MORE VALUE

Yes—we should like you to mention THE AMERICAN CITY.

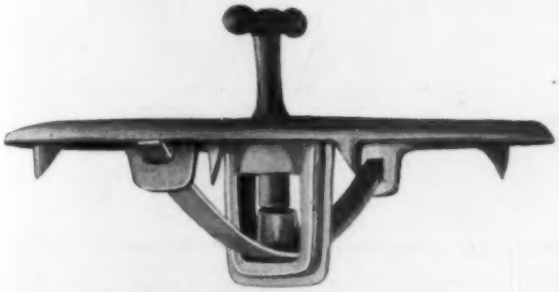
all necessary light and power for machinery with which this company made semi-commercial scale tests for its own work and for clients. Newly developed equipment was tried out here, and the application of old equipment to new industries was determined, governing the construction of many chemical and industrial plants well known today.

Other buildings on the property were saved by the vigorous efforts of the fire department. One is being equipped to continue analytical and testing work without delay, while semi-commercial testing will be delayed only until the arrival of new machinery. The Dorr Company expects to rebuild the mill immediately.

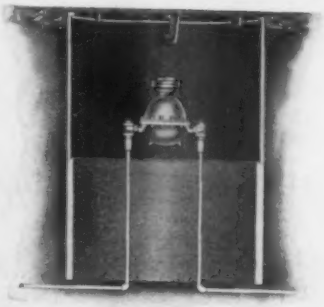
Self-Locking Meter-Box Tops

The Ryder self-locking meter-box, made by the Clarksville Foundry & Machine Works, Clarksville, Tenn., consists of four parts—the box body, the cover, a spring, and a plug. The box body or frame is made of cast iron of any desired shape, having a flange at its upper edge providing a flaring recess upon which the cover rests and underneath which the locking spring projects. The top is made of cast iron and has an opening in the center for the key. A boss is provided on the under side of the top around this opening which is spanned by an arch-shaped guard. Two guide-lugs are provided on opposite sides of the boss near the edge through which the spring passes.

The spring is made of the best spring steel, or brass if desired, and passes through the guard and two guide-lugs. On the center of this spring a lead or brass plug is riveted which is shaped so as to fit snugly into the cover of the box and keeps the opening in the box closed. The key for unlocking the box serves both as a key and as a handle by which to remove and replace the cover. The bottom end of the key is made of the same shape as the opening in the top of the box, while the intermediate part is round and of such length as to allow the elliptical part to pass through the cover and beyond the boss, so that the key may be turned in any direction. The top part is simply a handle by which the key is turned and by which the top may be lifted off or placed on as desired. In order to unlock the box, the key is forced down through the opening in the center of the cover until it strikes the shoulder of the key. It is then given a quarter-turn. This forces the spring down in the center and causes the ends to draw away from the lugs or flange under which they fit. The elliptical portion of the key is now crosswise of the opening in the cover, so that the top may be lifted off by the use of the key as a handle. When it is desired to lock the box, the cover is placed upon the frame in its proper position and the key given another quarter-turn. The spring then forces the plug back to its seat, and the ends of the spring again project underneath the lugs or flange on the box body so as to effectually prevent the removal of the top.



THE RYDER SELF-LOCKING METER-BOX COVER WITH KEY INSERTED



TYPICAL METER SETTING IN AN OVAL METER-BOX WITH EXTENSION

New York Buys 126 More White Trucks

Delivery is now being made by the White Company, Cleveland, Ohio, on orders from various municipal departments of New York City, for 126 new White trucks, which would increase the White fleet owned by the city of New York to a total of 1,072 units.

The Bureau of Street Cleaning of the Borough of Queens bought 57 trucks, including 50 heavy-duty dump-trucks for the collection of garbage and rubbish, four light-duty trucks for hauling supplies, and three heavy-duty models as wrecking equipment, consisting of winches, cranes, and traveling chain hoists.

The Department of Street Cleaning which serves Manhattan, Brooklyn and Bronx Boroughs, bought 50 White heavy-duty dump-trucks with special equipment for hauling garbage and ashes and for snow removal.

Other New York municipal purchases include seven Whites for Bellevue and Allied Hospitals, six being ¾- to 1-ton ambulance chassis, and one a light-duty chassis with panel body for general hauling; four heavy-duty White trucks with asphalt bodies for the Bronx Borough Department of Public Works; four heavy-duty Whites for the same department in Manhattan Borough, two for asphalt delivery and two for catch-basin cleaning apparatus; two Whites for the Department of Public Welfare, including a 2½-ton chassis with panel body for general delivery work and two ¾- to 1-ton chassis with ambulance body and one with hearse body; and one heavy-duty White oil distributor for highway work in Brooklyn.

New Cleveland Manager for Chicago Pump Company

The Chicago Pump Co., 2319 Wolfram Street, Chicago, Ill., has announced the appointment of Tandy L. Jackson as District Manager for the Cleveland territory, with offices in the Plymouth Building, 2036 East 22d Street, Cleveland, Ohio.

Don't forget next Winter's snow!

R4 at 34th Street and Madison Avenue, New York City

46 NELSONS were used on New York City snow last winter.

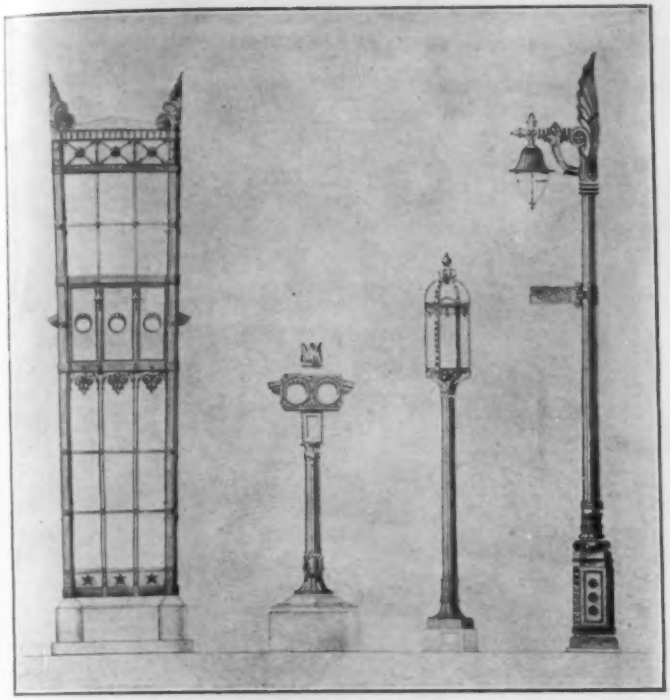
Put a NELSON R-4 into YOUR budget.

Use it for sand, earth, gravel, ashes or garbage on your roads and dumps in the summer, and

KEEP YOUR BUSY STREETS CLEAR OF SNOW ALL THROUGH THE WINTER

N. P. NELSON IRON WORKS, Inc.
822 Bloomfield Ave. Passaic, N. J.

Yes—we should like you to mention THE AMERICAN CITY.



TYPES OF STREET-LIGHTING STANDARDS AND TRAFFIC-CONTROL UNITS ACCEPTED FOR USE AT BISCAYNE BAY, FLA.

Biscayne Boulevard Ornamental Street-Lighting Contract Awarded

Biscayne Boulevard, a level highway extending along Biscayne Bay and through the principal residence district of Miami, will be lighted in an unusually attractive manner. Lighting units equipped with the latest type of refracting glassware to control the light distribution, will be mounted on specially designed ornamental cast iron standards. The contract for this equipment, amounting to about $62,000, was recently placed with the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

The Biscayne street-lighting installation attracted much attention when the Biscayne Bay Association offered a prize of $1,000 for the best design submitted, the merits of the design to be decided from the standpoint both of beauty and of illumination. A report of this competition appeared on page 835 of the December, 1926, issue of THE AMERICAN CITY MAGAZINE. The prize was awarded to S. Grillo, of New York City, for the best design out of thirty submitted in the competition. Bennett, Parsons & Frost, architects of Chicago, acted in an advisory capacity for the judges.

Apart from the exceptionally attractive character of the ornamental standards, Biscayne Boulevard, will, when the installation is completed, be counted among the best-lighted streets in the country. The lighting units will be of the pendant type in which will be mounted Westinghouse-Holophane Bi-lux refractors. The Bi-lux refractor controls the light, which would otherwise make bright areas around the standard with areas of darkness between, or which would be wasted skyward, and directs it uniformly along the street. The refractors are enclosed in rectilinear glass globes which impart a sparkling character to the light.

The contract includes 304 standards 16 feet high, 32 standards 19 feet high, 22 standards with lanterns, and 35 traffic posts. No traffic towers have been ordered at this time.

Premolded Joints for Concrete Roads

In a pamphlet describing Sealtight premolded expansion joints for concrete pavements W. R. Meadows, Inc., Elgin, Ill., discusses types of premolded joints. The first type discussed is the premolded joint with reinforced sides. The stiff sides, projecting slightly above the surface of the pavement, are said to hold the sealing material away from the edge of the crack, allowing water, street acids, and dirt to seep into the crevice, which tends to permit deterioration of the pavement.

Expansion joints which depend on a high melting point and a large percentage of filler are said by this company to form a mushroom protuberance above the crevice because the filler prevents complete sealing. In cold weather this protuberance is likely to break off, thus shattering the material in the crack and permitting foreign matters to enter.

Sealtight, the product of this company, has no reinforced sides to give it stiffness, as the rigidity is provided by a specially manufactured blown asphalt and by long, flexible fiber filler. Thus, the material is easily handled in any weather and, upon oozing, keeps the joints sealed tight.

An analysis of the asphalt used in Sealtight expansion joints shows that it has a melting point of from 235 to 240 degrees Fahrenheit, a penetration of not less than 20 at 32 degrees Fahrenheit, a penetration of 30 to 35 at 77 degrees Fahrenheit, and a penetration of not more than 45 at 115 degrees Fahrenheit. The manufacturers require an asphalt which must not be too soft for handling in the summer, nor too brittle in winter. The fiber acts as a deadener and serves to retard any tendency to run in hot weather or to shatter in cold weather. It serves to bind the entire joint into a tough, resilient, shock-resistant mass. It is stated that without a fiber base asphalt is unable to withstand the shocks of heavy

CLOSE-UP OF SEALTIGHT JOINT

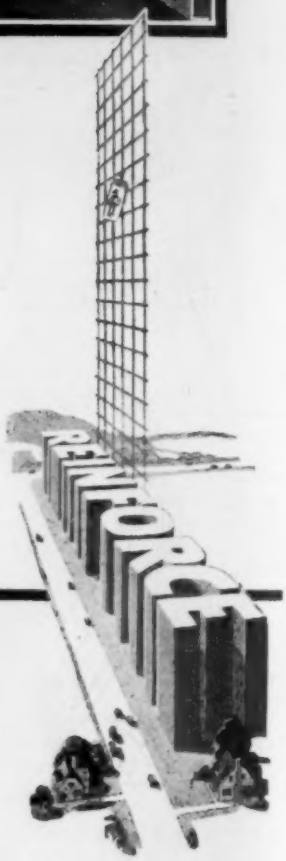
NATIONAL REINFORCING
Makes *Reinforced Concrete* Road Construction Easy

THE modern practice of additional reinforcing steel concentrated at the edges and longitudinal joints of road slabs requires larger members at these points than throughout the rest of the slab.

NATIONAL REINFORCING supplies this needed additional reinforcing [heavy edge wires] in a single sheet of welded fabric and, at the same time, provides proper reinforcing for the balance of the slab. Besides, it eliminates the handling and tying of thousands of loose members and thus cuts down time and labor costs.

There is a style of NATIONAL REINFORCING to meet every specification.

Phone, wire or write our nearest district office for information and prices.



NATIONAL STEEL FABRIC COMPANY
Subsidiary of Pittsburgh Steel Company
709 UNION TRUST BUILDING, PITTSBURGH, PA.

District Offices

Atlanta, Ga. Cleveland, O. New York City, N.Y. Portland, Ore.
Chicago, Ill. Detroit, Mich. Philadelphia, Pa. Rochester, N. Y.
Cincinnati, O. Los Angeles, Cal. Pittsburgh, Pa. San Antonio, Tex.
San Francisco, Cal. Seattle, Wash. St. Louis, Mo.

Warehouses

Los Angeles San Francisco Chicago St. Louis Houston
Pittsburgh Philadelphia New York

WORLD'S LARGEST MANUFACTURERS OF WELDED STEEL FABRIC

traffic. A combination of the fiber and asphalt produces a material of rubber-like resiliency, tough and weatherproof.

In the temperate zones the variation in temperature is frequently 135 degrees Fahrenheit during the year. The coefficient of expansion of concrete is 0.000005 per degree Fahrenheit. Therefore, the year's variation in the length of a mile of pavement, due to temperature alone, would be approximately 40 inches, but moisture produces changes practically as great. Consequently, the expansion and contraction per mile would be much more than 40 inches. It follows, then, that the life of a piece of concrete paving depends upon the serious consideration given to the expansion problem. Sealtight joints of ½-inch thickness should be placed transversely at 30-foot intervals to take care of expansion and contraction in the concrete slabs.

Cleaning Streets with Tractors

The tractor and semi-trailer haulage principle which is proving such a saving in many heavy-haulage operations, is now being applied successfully to street flushing and sprinkling. A tractor outfit, according to the Trail-It Co., 2516 Wabash Avenue, St. Paul, Minn., costs less money and operates at a saving. With the automatic Trail-It hitch coupling, the tractor is instantly available for any other kinds of tractor work, such as tractor hauling and street work.

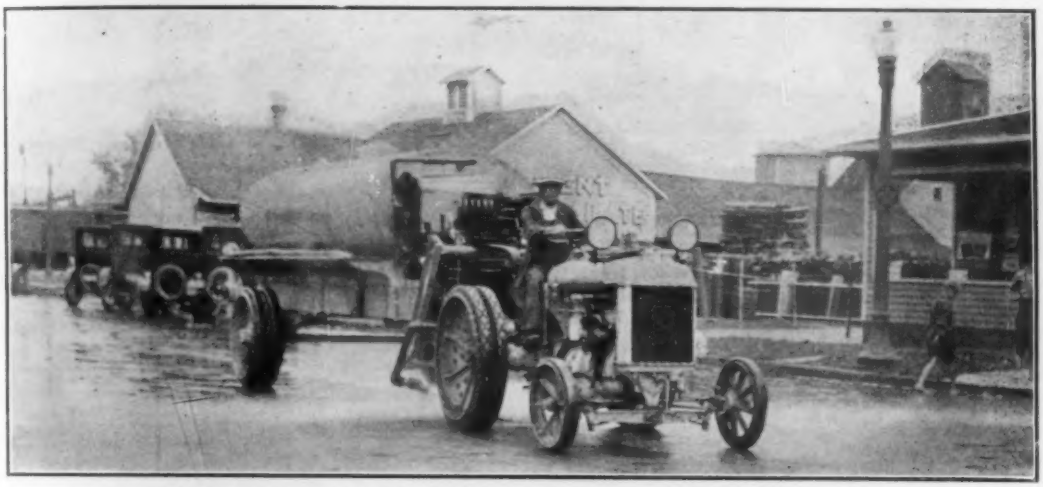
When flushing, the tractor can turn so short that the semi-trailer flusher unit is swung around on its own axle center. It is usual practice to make a complete loop at each street intersection so as to give a double cleaning at this point, and the loop is made without reduction in speed and without changing the flow of water, a distinct advantage in effective street cleaning.

This rapid handling by tractor use effects a saving in the amount of water used for a given distance, and yet the tractor fills and uses more tanks per day than is possible with a truck, because it wastes less time maneuvering. The result is more work per day per unit and thus considerable saving.

Three New Garbage Destructors for Birmingham, Ala.

The city of Birmingham, Ala., has recently contracted with the C. O. Bartlett & Snow Co. for the construction of three destructor plants. This contract is unique in that Birmingham is probably the first city in this country to provide funds and let a single contract for the full number of plants to meet the requirements of the entire city. The largest of the three plants is located in the central part of Birmingham and has a capacity of 180 tons of mixed refuse per 24 hours. The next largest is in the Ensley section of Birmingham and has a capacity of 90 tons in 24 hours. The smallest plant is located in North Birmingham and has a capacity of 60 tons per 24 hours.

The furnaces of all three plants are of the Sterling high temperature type. The buildings are designed for expansion and for future increase to double the present furnace capacity. The receiving facilities permit the unloading of any type of collection equipment, including rear-dump trucks and side-dump trailers. The contract requires the completion of two plants in a period of six months and of the third plant in nine months. The contract price for all three plants is $352,800. The entire work is being performed by the C. O. Bartlett & Snow Co., Cleveland, Ohio, under the direction of A. J. Hawkins, City Engineer, Birmingham, Ala.



1250-GALLON SEMI-TRAILER FLUSHER OWNED BY FAIRMONT, MINN.
This flusher is equipped with the Trail-It attachment for use with Fordson tractor

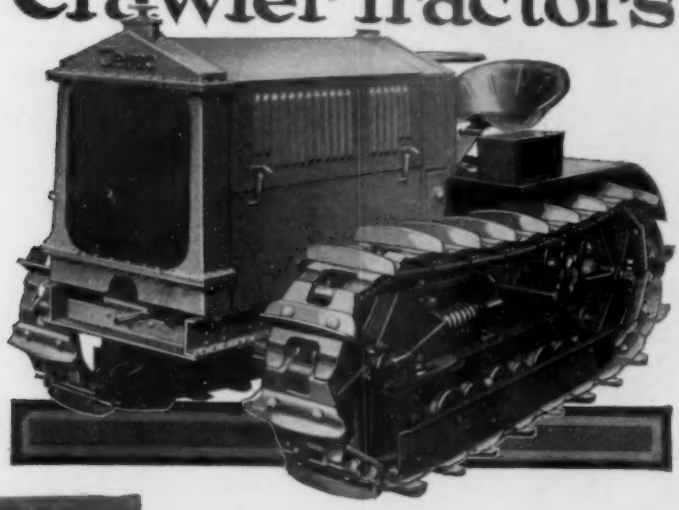
New Advertising Agency

J. William Atherton, formerly of the Morse International Agency, 449 Fourth Avenue, New York, has formed an advertising agency, known as Atherton & Currier, Inc., located in the Graybar Building 420 Lexington Avenue, New York.

Pipe Cleaning Company Moves Office

The General Pipe Cleaning Co., Inc., has announced the removal, on April 1, 1927, of its office from 23rd and Westmoreland Streets, to 735 Commercial Trust Building, 15th and Market Streets, Philadelphia, Pa.

Cletrac
Crawler Tractors



Lowered Costs
—Per Yard, Per Mile, Per Hour!

WHERE economy of costs is demanded along with extraordinary service, no other tractor meets the situation so completely as CLETRAC. Here is a tractor of ***truly superior excellence***—not by virtue of manufacturer's claims, but in the light of remarkable performance and lowered costs on literally thousands of jobs requiring tractor power. ***For street and road construction, grading, leveling, trench filling, excavating, earth-moving, hauling and road maintenance***—whether figured per yard, per mile or per hour—CLETRAC is the most economical and capable tractor power you can use.

Note These CLETRAC Features

CLETRACS deliver ***more pounds pull*** at the drawbar than any other tractor of equal weight.

CLETRACS have ***positive traction*** that carries the limit load over all kinds of footing in any weather.

CLETRACS have ***exceptional ease of control***, and ***short turning radius*** that permits freedom of action in close quarters.

CLETRACS have ***"One-Shot" lubrication*** that oils the tractor thoroughly and instantly at the push of a plunger—without time-out.

These and a score of other features in keeping with CLETRAC'S advanced design enable these tractors to perform ***more work and better work, more days in the year*** than any other type of tractor.

Please send literature on the following models:

☐ Cletrac 20K ☐ Cletrac 30A
☐ Cletrac "75"

Name .....

Address .....

.....

For full literature on the CLETRAC 20K, 30A or CLETRAC 75, mail the coupon or write

THE CLEVELAND TRACTOR CO.
CLEVELAND, OHIO

END VIEW OF NEW STUDEBAKER POLICE PATROL

A New, Specially Designed Police Control

A specially designed police patrol which is offered as a complete unit has recently been announced by the Studebaker Corporation, South Bend, Ind. This new Studebaker police patrol is mounted on a specially constructed chassis of 158-inch wheelbase, and is powered with the 75-horsepower Studebaker Big Six motor. The patrol is capable of operating at from 5 to 60 miles per hour and is reported to take steep grades without engine stress when carrying its full load of 17 persons. It has a low-hung chassis, and four-wheel brakes.

Because of the frequent need of police patrols to carry patients to city hospitals, this patrol has been equipped for hospital service. The right seat is fitted with a folding ledge 8 inches wide which when opened forms a comfortable cot for patients. Long special springs and oversize tires absorb the road shocks, and the well-balanced chassis is carried as smoothly as an ambulance. Seats in the rear compartment run the full length of the body on each side. The seat cushions are 3½ inches deep and 14½ inches wide, made of semi-bright pebble-grain black genuine leather and stuffed with curled-hair padding. The back cushions are made of canvas-covered buckram, padded with hair and faced with black genuine leather. They are removable for cleaning.

The long, low lines and deep police-blue lacquer finish distinguish this machine. The body was designed to give low center of gravity without sacrificing headroom. The inside dimensions of 104 inches in length back of the driver's seat and 58½ inches in width with a headroom of 61 inches, show the roominess of the interior, which seats fourteen persons.

The floor is covered with battleship-gray linoleum glued to the floor. Two trap-doors in the floor facilitate easy access for oiling and greasing the chassis. The rear door opened is 29 inches wide and is equipped with a Pullman curtain on a roller, operating in slides on both sides of the doorway. If desired, a full-length rear door with adjustable glass, protected by a screen inside, can be furnished. The rear platform is mounted on two heavy brackets. This platform is 49 inches wide by 18 inches deep. Heavy nickel-plated handrails are securely mounted with bolts. Heavy sheet-steel panels sheath the body, which is securely joined and braced for long life. The corner moldings are designed to permit the replacement of any damaged panels.

Equipment includes a one-piece windshield with metal sun visor, automatic windshield cleaner on the driver's side and hand cleaner on the right. The driver's compartment is equipped with curtains made in two sections on steel rods, and opening and closing with the doors. Observation of the rear compartment from the front seat is permitted through a window at the driver's right. This opening is covered with heavy wire mesh and a curtain with celluloid lights. At the left the driver's back is protected by a heavy bulletproof steel panel. For signaling the driver, there is a buzzer in his compartment, operated by a push-button at the rear.

The Use of Admixtures in Concrete

An oxychloride of calcium, a dry, white powder, known as Cal, used as an admixture to portland cement concrete and water, has a combination of properties which facilitates and expedites new construction and repairs, according to the North American Cement Corporation, Hagerstown, Md., manufacturers of this product. This admixture accelerates the hardening of all portland cement concrete and mortar, bringing them to safe working strength in a fraction of the usual time. Just as it comes from the container, Cal is added at the mixer. From actual tests and job experience covering many years, it has been found that when Cal is used, forms may be removed from all kinds of work in much less than normal time and that road and street construction can be put into full service in 48 to 72 hours. Road patching can be accomplished with little interruption to traffic. In addition, Cal cures, fattens, hardens, and densifies all portland cement mixtures and reduces the cold-weather hazard. This material reduces the amount of water necessary in making the concrete conveniently. It prevents the segregation of the aggregates and makes a concrete mixture more easily workable and easier flowing. It prevents the too rapid drying-out of concrete or stucco in very hot or dry weather and thus minimizes the danger of surface cracks, checks, crazing, and disintegration. It fattens and stabilizes the concrete mixture so that segregation is reduced to a minimum. This is of special importance in chuting concrete or in transporting from central mixing plants.

After eight years of exhaustive tests, Cal was put on the market in 1919. Acceleration was not the least improvement sought, as indicated by the following extract from Technologic Paper No. 174 of the U. S. Bureau of Standards:

"A demand for a practical and efficient material for accelerating the hardening of portland cement mixtures has received considerable attention in recent years. The need for such a material becomes of more consequence with the introduction of more rapid methods in construction and with the increased amount of concrete repair and replacement work. Serious problems arise when it becomes necessary to interrupt or divert traffic for the duration of time required for concrete to

TRACKSON-CRAWLER

"Sure-footed" In Rough Going!

REGARDLESS of ground conditions, the Trackson takes the Fordson through the roughest going. It gives it sure-footing at all times and together with the Fordson forms a 2-ton crawler tractor that is unparalleled in performance and unequalled in economy.

In the Trackson-Fordson you get the greatest track area for steep pulls; you get lowest ground pressure per pound of weight for work in mud, sand, or snow; you get increased drawbar power; you get an all-steel crawler that converts the Fordson into the most generally adaptable 2-ton crawler tractor on the market.

This is what it will do—cut your costs on grading, leveling, ditching, trench filling, excavating, hauling and snow removal work. Use it as readily and as profitably one month as the other the year around.

Let us send you our special Public Works Bulletin. It will mean a lot to you—it costs nothing but the asking and will show you how you can cut your costs. Send back coupon today.

Trackson Company
MAKERS OF FULL-CRAWLERS
518 CLINTON ST. MILWAUKEE, WIS.

These 6 Advantages Are Combined in no Other Crawler

1. All-steel construction—no cast iron parts.
2. Fewest working parts—lowest upkeep cost.
3. Patented non-clogging track of specially hardened alloy steel.
4. Greater track area—better traction—less ground pressure.
5. Oil reservoir type dirt-proof bearings.
6. Simple steering—no complicated clutches.

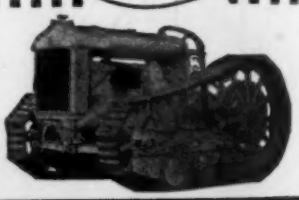
Trackson Company 518 Clinton St., Milwaukee, Wis.,

Gentlemen:—Without any obligation please send me specific information on the class of work indicated.

( ) Grading ( ) Excavating ( ) Loading ( ) Hauling ( ) Fresno ( ) Backfilling

Name _____

Address _____



ONE OF 19 CROSSOVERS IN THE CITY OF PHILADELPHIA RENEWED WITH CAL-TREATED CONCRETE BASE

This view was taken at the corner of Broad and South Streets at 11:45 A. M. on April 1, 1926. Full traffic was restored at 9:50 A. M. on April 3, 1926, and work started on the other side

harden sufficiently. The increased cost of lumber for forms has necessitated a more judicious use of such material, and its removal for further use as soon as the strength of concrete will allow. This applies even more to the use of steel forms, which are rapidly replacing wooden forms in a great many types of concrete construction throughout.

"The effect of Cal on the setting time of normal portland cements may be seen by examining the results. . . . The set was hastened in all cases and to a greater extent by the larger percentage of Cal.

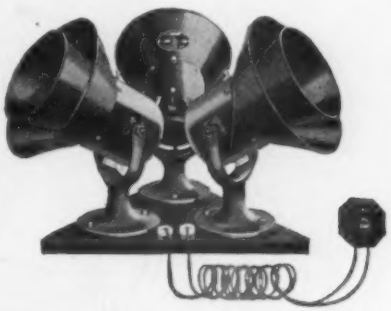
"The setting of normal portland cement mixtures may be hastened by Cal to an extent that is very desirable in concrete construction requiring a finished surface. The finishing operation may proceed with much less delay after the concrete has been placed, which should result in cutting down over-time labor. The hastening of the set is not objectionable in any type of construction, providing the concrete is placed soon after it is gaged with water.

"Cal was used in a concrete floor topping alongside of topping containing no accelerator, for the purpose of observing the effect under actual field conditions. The treated topping was ready for the finishing operation in about one-half the time required by the untreated, as judged by the finisher. This agreed very closely with the results of the laboratory tests on the rate of setting of the two mixed, by means of the flow table."

A New Siren Fire-Alarm with a Wide Range

A new siren, designed to serve as a fire-alarm in villages, schools, industrial plants, factories, mines and warehouses, has been announced by the Federal Electric Co., 8700 South State Street, Chicago, Ill. This Triple-A siren consists of three sirens mounted on a triangular base. They are connected in parallel and operate from one push-button switch. Each siren has approximately one-third horsepower.

The tone of each of the three sirens is different from that of the other two, giving a three-tone combination. With a siren mounted on each angle of the triangular base, the Triple-A thus penetrates in every direction and has a sound radius of from three-eighths to one-half mile under normal conditions. The manufacturers state that the upkeep of this siren, including electricity, is less than two dollars a year. It is simple in construction and built of the best materials. It is entirely enclosed, and the motor housings, stators, and rotors are die-cast from high-grade aluminum. The entire unit is finished in red Duco and weighs 40 pounds.



THE FEDERAL TRIPLE-A ELECTRIC SIREN

Albion Made District Engineer

The Portland Cement Association, 33 West Grand Avenue, Chicago, Ill., has announced the appointment of H. R. Albion as District Engineer in charge of the Jacksonville office of the Association. Before entering the employ of the Portland Cement Association in 1926 as Field Representative in Florida, Mr. Albion had wide experience in engineering practice, including five years as senior partner of the engineering firm of Albion and Ewing.

KOHLER, WISCONSIN, *the Model City*

SELECTS CHICAGO CONCRETE STANDARDS

The trademark "Kohler of Kohler" everyone knows stands for a quality mark in the manufacture of enameled plumbing ware. In planning the model community of Kohler, Wisconsin, the home of "Kohler of Kohler," the quality mark was foremost at all times to the smallest detail.

The Board of Engineers and town planners selected unanimously, after thorough investigation and tests, the CHICAGO TYPE G-11-foot CONCRETE STANDARD for beauty, utility and low maintenance cost.

For eight years Kohler has purchased each year several hundred standards for additional lighting in this rapidly growing community.

Let us help you solve your lighting problems!

CHICAGO CONCRETE POST COMPANY

PAUL K. FLEMING, President

Lawrence, Lamon and Leland Avenues

Chicago, Illinois, U. S. A.

The Advantages of the Two-Motor System in Street Flushing

To clean streets thoroughly and efficiently, several features of street flushing are important—pressure, volume, truck speed, and nozzles with a sweep and width to give effective application of the water. The flushers made by E. D. Etnyre & Co., Oregon, Ill., are designed and arranged to be operated by one man, who can instantly regulate the pressure of the water at the nozzle, the speed of the truck, and the volume of the discharge, to conform to the width and condition of the pavement and the amount of accumulation to be removed. The speed of the motor which governs the pressure and force of the stream is controlled by a throttle convenient to the truck driver, so that any desired pressure can be instantly obtained. The pressure gage on the dashboard registers the pressure.

The two-motor system is rapidly becoming recognized as the proper method for driving the pump. The amount of water that is required to clean a street depends entirely on the condition and amount of accumulation. The speed at which the truck is operated also depends on the same conditions. By the use of the separate motor for driving the pumps, the volume of water and speed of the truck can be regulated to meet these conditions effectively and efficiently, for the reason that the speed of the pump is entirely independent of the speed of the truck.

With the Etnyre heavy-duty pumping unit, any combination or all four of the nozzles can be used simultaneously, so that a street 40 feet wide can be cleaned effectively. Traffic conditions will not always permit of cleaning the full width of the street at one time, but when it is possible, there is 50 per cent saving in truck mileage.

A Light-Weight Bullet-proof Vest for Policemen

A bullet-proof vest which is guaranteed to stop, with the resistance of the body, any caliber revolver or pistol bullet up to and including a .45 caliber metal-jacketed bullet, excepting a German Luger or rifle bullet, has been successfully developed by the Police Equipment Co., 139 North Clark Street, Chicago, Ill. The bullets, when striking the new vest, cannot glance off or ricochet or injure anyone. The vest is flexible, evenly balanced, gives freedom of action to all parts of the body, and is equally adaptable for foot, mounted, or motorcycle duty. It covers and protects all vital parts of the body and fits and looks like an ordinary vest. The bullet-proof vest consists of a specially constructed light armor made in Sweden especially for the Police Equipment Co., combined with chemically treated cloth and fiber.

An official demonstration of this vest held before the International Association of Chiefs of Police of the United States and Canada is shown in the accompanying illustration. Lieutenant Charles Egan, crack shot of the Chicago Police Department, fired point-blank at Louis Wisbrod from a .45 caliber Army Colt without causing any injury.

OFFICIAL DEMONSTRATION OF BULLET-PROOF VEST, HELD BEFORE THE INTERNATIONAL ASSOCIATION OF CHIEFS OF POLICE OF THE UNITED STATES AND CANADA

Lieut. Charles Egan, crack shot of the Chicago Police Department, fired point-blank at the vest from a .45 caliber Army Colt

Among the many advantages which have led park commissions to standardize on Cyclone Fence, one stands out sharply: Cyclone is the only fence made entirely of Copper-Bearing materials. That means greatly increased resistance to corrosion, maximum endurance, minimum cost per year for dependable property protection.

Cyclone Chain Link Fence is built in standard types for park and playground purposes, also specially constructed for zoos, aviaries, etc. We also manufacture Wrought Iron Fence and entrances for public and private grounds. Catalog of fencing for municipal property sent upon request.

Phone, wire or write nearest offices

Cyclone Fence Company

Main Offices, Waukegan, Ill.

Works and Offices:
North Chicago, Ill.; Cleveland, Ohio;
Newark, N. J.; Fort Worth, Texas.

Pacific Coast Distributors:
Standard Fence Co., Oakland, Calif.
Northwest Fence & Wire Works, Portland, Ore.

Branch Offices in All Principal Cities

Cyclone Fence
REG. U.S. PAT. OFF

Cyclone Tennis Court Enclosure. Made of "Galv-After" fabric, No. 11 gauge Copper Bearing Steel Wire woven in 1¾-in. chain-link mesh. Tubular Framework, Copper-Bearing Steel, heavily hot-dip-galvanized. Standard height 10 ft.

CYCLONE FENCE COMPANY

The Mark of Dependable Property Protection

The only fence made entirely of copper-bearing materials—for maximum endurance

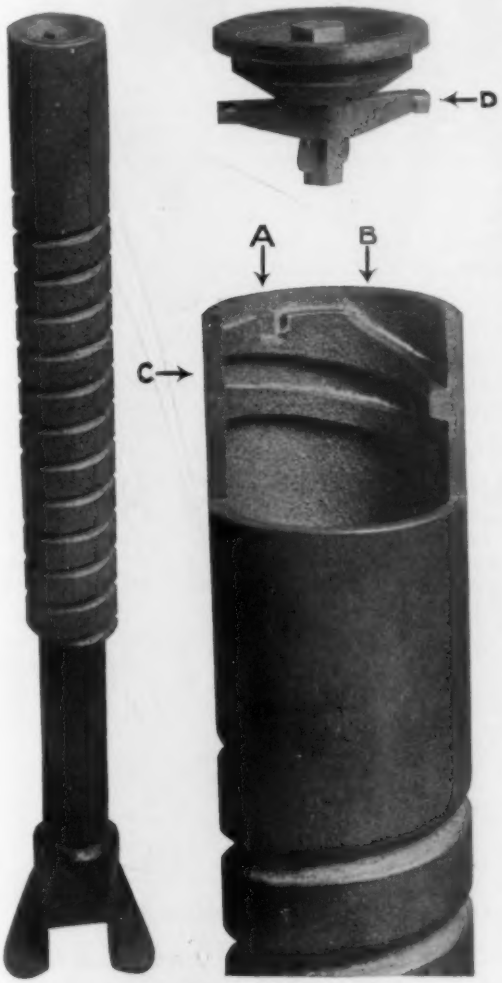
© C. F. Co. 1927

A Curb Box Not Affected by Heaving Ground

A curb box which has no projections beyond its vertical sides, and which therefore presents no surface for the frost to lift, has been developed by the Reading Meter Repair Company, Inc., Reading, Pa. The result of the upward action of the frost on the Reading curb box is to slide the earth along the outside of the box and raise the sidewalk surface an inch or two above the top of the box. After the frost leaves the ground, the surface level recedes to its original position, leaving the old-style box with its horizontally projecting top in the air, but the Reading box remains in its original position, level with the sidewalk.

For raising and lowering the Reading boxes in cases where sidewalk levels are changed, slots have been provided for the insertion of a flat piece of iron or steel, on which a large wrench with a long lever can be placed to permit the adjustment of the upper section of the box.

An enlarged view of the lid of the box is shown in the upper portion of the illustration. The body of the lid is of cast iron. The five-cornered nut and its shaft are of bronze, and the locking lever is also of bronze. The cotter-bar is of wrought iron.



THE READING CURB BOX
At left, the box complete; top right, enlarged view of lid; right, enlarged section of top of curb box

The bronze shaft, with its locking lever and cotter-bar, work freely in the cast iron lid. The locking bar enters the groove in the box at B, and when screwed down holds the lid tightly by contact with the upper portion of the groove.

In removing the lid, the first operation of the key when turned to the left is to release the tension which holds down the lid. The further turning of the key produces an upward pressure on the lid which, with the assistance of tapping, will lift the lid off its seat, and the continued turning of the key raises the lid free of the box. The lid, being free from the shaft, does not turn. There is a certain amount of play between the locking bar and the lid to permit the operation as described.

Dabney H. Maury Retires from Consulting Firm

F. G. Gordon, Monadnock Block, Chicago, Ill., has announced that Colonel Dabney H. Maury has retired from the firm of Maury & Gordon, having discontinued active practice. Mr. Gordon will continue the consulting work of the firm, covering water-works, sewerage, power-plants, and appraisals.

New Yeomans Representatives in Texas and Michigan

Yeomans Brothers Co., 1417 Dayton Street, Chicago, Ill., has announced the appointment of three new representatives: Texas Engineering Co., 925 Electric Building, Houston, Texas; Dillard Engineering Co., 612 Construction Industries Building, Dallas, Texas; and Heating and Ventilating Equipment Co., Builders and Traders Exchange, corner Lyon Street and Ionia Avenue, N. W., Grand Rapids, Mich. These representatives will handle the complete Yeomans line of sewage ejectors, bilge pumps, house booster pumps, and conduit station return pumps.

Anchor Post Fence Co. to Build Baltimore Factory

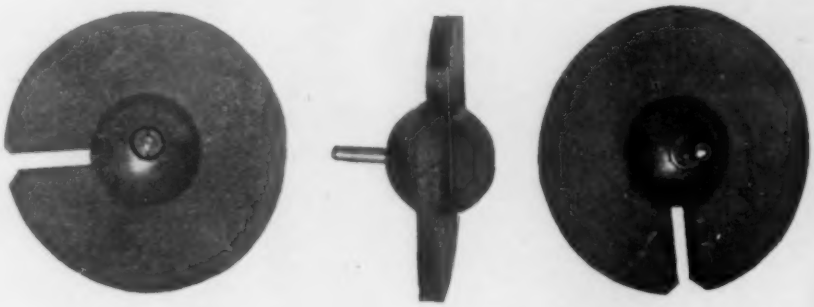
The Anchor Post Fence Co., 9 East 38th Street New York City, manufacturers and erectors of chain link and similar types of wire fences, gates and railings, has acquired control of a site in Baltimore, for the erection of a new manufacturing plant. The site selected is in the eastern industrial section of Baltimore, having direct rail connection by means of the Canton Railroad with both the Baltimore and Ohio and the Pennsylvania Roads.

The excellent shipping facilities at Baltimore, both by rail and by water, abundant labor supply and other advantages resulted in the selection of this Baltimore site. It is the intention of the company to make this new plant its main eastern factory. The company now operates plants at Cleveland, Ohio, and Garwood, N. J., and distributes its products through branch sales offices and agents through the country.

The first unit to be erected will be a one-story steel and concrete manufacturing and storage building, 200 feet wide by 500 feet in length. Building operations will be completed by fall.

How Would *Your* Meter Discs Show Up under these Conditions?

Subjected to Heat of 270° Fahrenheit and still in Perfect Condition!



(Nearly *a Million* in Service!)

THIS actual test, conducted by one of the largest cities of the country, involved a steam test at 270° Fahrenheit without injury, the meters in which they were used showing the same accuracy after the test as before, down to and including 1/32-in. stream.

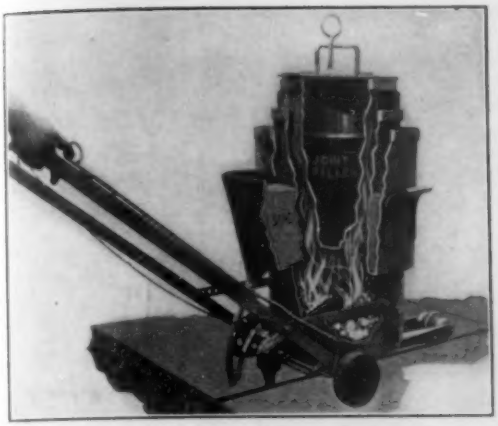
Details of this unusual and fully convincing test will be furnished upon request; but even better evidence of the superiority of NOWARP Meter Discs lies in the fact that we have made approximately 1,000,000 and that they are specified by Detroit, Cleveland and other leading cities throughout the country.

NOWARP METER DISCS

are manufactured of graphite by a special process and are not only heat-resisting but self-lubricating. No ordinary hard rubber disc could possibly stand the sort of service NOWARP Discs are able to withstand. The present disc has been manufactured, with constant improvement, since 1914, and our wealth of experience in this field is at the service of both manufacturers and users of water meters at all times. We shall be very glad indeed to hear from you regarding the NOWARP Meter Disc or other specialties which we manufacture including registers and dials, meter couplings, cast iron frost bottoms and pump valves. Address:

THE FRED W. HANKS CO.

10624 St. Clair Ave., Cleveland, Ohio.



THE NEW HELTZEL JOINT-POURING MACHINE

A New Joint-Pouring Machine with Interesting Features

A new joint-pouring machine which is so constructed that the fire is between the joint filler compartment and the sand compartment, has recently been developed by the Heltzel Steel Form & Iron Co., Warren, Ohio, to heat, pour, and sand joints in concrete pavements.

The fillter discharge pipe passes through the fire-box, which maintains a uniform heat, thus depositing the filler at a uniform temperature. The flow in the discharge nozzle is regulated by a needle valve. Inasmuch as the filler is heated at the time of pouring, it penetrates to the bottom of the joint. The manufacturers claim 90 per cent heating efficiency in this joint-pouring machine.

The flow of the sand and filler is controlled by hand-operated rods which are adjustable as to height. No bridging is necessary, as the broad-tread wheels do not mar the concrete. A pilot-wheel rides in the joint, insuring alignment.

The sand compartment is recommended for use on grades, to prevent the filler from flowing out, but is not necessary on semi-level roads. A fire-box is provided for any kind of fuel or is equipped with an oil burner when desired. This machine may be used for pouring both longitudinal and transverse joints.

Pearson Representing Etnyre in the East

George E. Pearson, formerly sales manager, Acme Road Machinery Co., Frankfort, N. Y., is now in charge of sales of Etnyre flushers and asphalt distributors in the eastern states for E. D. Etnyre & Co., Inc., Oregon, Ill. Mr. Pearson's address is 11 Beacon Street, Boston, Mass.

Fabric Fire Hose Co. Moves New York Office

The Fabric Fire Hose Co., manufacturers of waxed cotton rubber-lined fire-hose and hose of every description, formerly located at 127 Duane Street, New York, has moved its office to the Park-Murray Building, 9-15 Park Place, New York.

New Pittsburgh Testing Laboratory Office in Youngstown

The Pittsburgh Testing Laboratory, Pittsburgh, Pa., has announced the opening of a branch laboratory and inspection headquarters in Youngstown, Ohio, with H. L. Christman, who has been identified with the testing and inspection profession for over twenty years, in charge. This branch is equipped for all kinds of physical tests on engineering and construction materials, a part of the equipment being a 200,000-pound Universal Olsen testing machine.

H. Burdett Cleveland, Consulting Engineer, Moves Office

H. Burdett Cleveland, consulting sanitary engineer, with offices formerly at 38 Park Row, has announced the removal of his offices to the Transportation Building, 225 Broadway, New York.

Kennedy Moves Chicago Branch and Warehouse

The Kennedy Valve Manufacturing Co., Elmira, N. Y., has announced the removal of its Chicago branch and warehouse to 1335-1337 South Clinton Street, Chicago, in the new Soo Terminal.

A. L. Strong Made District Engineer of Cement Association

The Portland Cement Association, 33 West Grand Avenue, Chicago, Ill., has announced the opening of a district office in the Montana National Bank Building, Helena, Mont., with A. L. Strong as District Engineer for the state of Montana. Mr. Strong has been on the district office staff of the Association at Yakima and Seattle, Wash., since 1920. Prior to this, he was engaged in city and county engineering for ten years.

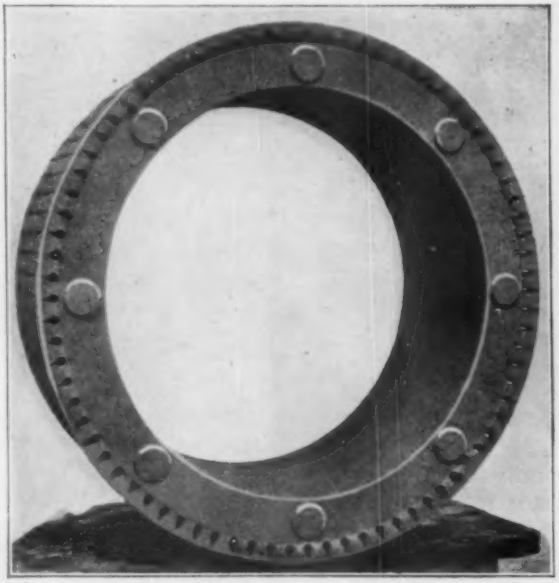
Municipal Signal and Equipment Corporation

Announcement has been received of the formation of an organization known as the Municipal Signal and Equipment Corporation, Room 918, 5 Beekman Street, New York, for the manufacture of a ball-bearing controller and standard traffic signal.

Ponca City, Okla., Adds to Municipal Diesel Plant

The Nordberg Manufacturing Co., Milwaukee, Wis., has recently received an order from Ponca City, Okla., for two 1,250-horsepower diesel engines, direct-connected to 750-kw. generators. This makes four engines of this size which Ponca City has purchased from Nordberg. It is the intention of the city to build an entirely new plant in a more favorable location, place the two units in the new plant, and later remove the two old engines to the new plant after the two new engines are running.

INDEX TO THIS VOLUME
(*January-June*, 1927)
immediately preceding back cover



A CONCRETE FACT

HUNDREDS of cities are getting along with "just enough" water. Some do not have "just enough" for their needs. Kelly Concrete Wells will furnish you more than "just enough." Our wells are guaranteed to furnish you sand-free water from any water-bearing formation.

The picture above is a section of the famous KELLY CONCRETE SCREEN. The whole exterior surface presents a full screening area, and immediately back of the screen is a solid concrete wall which gives it great strength and lasting quality.

Write for information or ask your neighbor.
Every city should have a KELLY WELL.

KELLY WELL COMPANY

GRAND ISLAND, NEB.

Do you mention THE AMERICAN CITY when writing? Please do.

Novalux Traffic Signals

The fundamental requirement of traffic signals is good indication—one that fairly compels the attention of motorists and unmistakably coordinates their movements. This requires high intensity in the direct path of the beam and also at wide angles. The optical system should project all the available light upon the traffic lane without loss in an upward direction, and must be protected by visors to prevent phantom indications that might otherwise be caused by the reflection of strong sunlight on the lens.

According to the General Electric Company, Schenectady, N. Y., Novalux traffic signals, made by that company, meet all these requirements. The Refracticon lenses give a higher degree of brightness than ordinary prismatic lenses. The signals, of very simple construction, consist chiefly of an efficient optical system and a one-piece housing of cast aluminum-silicon alloy which gives lightness of construction and great durability.

PENDANT TYPE G. E. TRAFFIC SIGNAL FOR SUSPENSION WIRE MOUNTING

The pendent signal consists of a three-section, one-piece, four-sided casting of aluminum with ornamental top and bottom. The housing has twelve rectangular openings, three on each side. A gasketed door is fastened to each of these openings by a special offset hinge. The doors are locked in position by a single wing-nut. The hinge axis of each door is so placed that the clamping action of the wing-nut presses the entire contacting surface of the door against the housing, making a weather- and dust-proof joint.

In the optical systems when the reflector system is used, a Refracticon lens of 8⅜ inches outside diameter is placed within the 8-inch opening of the door. This lens is specially designed to throw the upward light, which is generally lost, downward and sidewise, thus keeping the focus of the main beam within the driver's and pedestrian's vision. The lens is gasketed, and against this gasket is placed a spherical and parabolic reflector, newly designed to give a phantomless signal. The reflector, which is of Navy standard, has a protective coat of paint and a focal length of 2 inches, suitable for use with the 50-watt mill-type lamp or the new 60-watt A-21 short-base traffic lamp. The reflector with socket is fastened to the door by a spring wire bale. Thus, the door, lens, reflector, socket and lamp make a complete unit and are easily accessible for re-lamping.

PEDESTAL TYPE TRAFFIC SIGNAL, SHOWING PIPE SUPPORT AND CAST IRON BASE

The reflector, or Type-A, system uses a separate lamp for each door. For all suspension installations the top of the housing is fitted with a rotatable cast fitter, provided with an insulated spring, to which the leads are carried. This fitter serves as a means for attaching to a span wire or mast-arm suspension devices. The upper section of the fitter is circular in shape, supporting a ball and socket, which permits proper adjustment of the suspended signal. When chain suspension is used, four clevises, one in each corner, are fastened to the top of the housing through cast holes provided in the bosses for that purpose.

The same signal can be converted to a pedestal type by adding four tubular supports, which are fastened in four sockets at the corners of the base compartments of the housing. These tubular supports converge slightly and terminate in a socket support, which is bolted either to the concrete base or to a large cast iron base. The supports are 4 feet long.

One-way bracket signals, which are becoming

VOGT BROTHERS
VALVES AND HYDRANTS

Iron Body, Bronze Mounted Gate Valve

Consistently easy operation and long life are insured by the simple, positive wedge mechanism of Vogt Brothers Valves. A minimum of moving parts is required and abrasion and "freezing" of parts are eliminated by having no kindred metals which bear against each other: either iron bears against brass, iron against bronze, or brass against bronze.

These valves comply with, yet amply exceed, the A. W. W. A. Specifications. Parts are standardized and interchangeable. Valves can be installed with pressure at either side, and are suitable for working pressure of 150 lbs.—tested tight at 300 lbs.

Specify pipe size; valves to open right (clockwise) or left (counter-clockwise); and whether hand wheels or square key nuts for 2-inch wrench are desired.

THE POPULAR VOGT

Type 55 Revolving Head Hydrant

In the Vogt Brothers Type 55 Hydrant the nozzle outlets are in a readily removable head which can be revolved at any desired angle at any time. The nozzles of this hydrant are higher from the ground, yet the hydrant height is reduced. The size and number of nozzle outlets, as well as the hydrant length, can be easily altered as desired without digging.

The valve mechanism is located in the most rigid part of the hydrant and may be readily removed without disturbing the standpipe. Freezing is prevented by a simple and positive drain valve action.

The hydrant has a minimum number of parts. Metal compositions of adjacent parts have been selected for easy operation and long service. Safety features abound. Send for fully descriptive circular.

VOGT BROTHERS MFG. CO.
(NATIONAL FOUNDRY & MACHINE CO.)
INCORPORATED
LOUISVILLE, Since 1891 KENTUCKY

more and more popular, consist of a one-piece aluminum casting with three rectangular openings, to which either type of optical system can be fitted. The signals are designed for horizontal, vertical or pole mounting as desired. No angular doors are necessary, as the signals are adjustable to any required angle.

The automatic timer used in the central control system has a wide variation of timing. It is furnished with two dials. The first dial varies the total time-cycle from 60 to 120 seconds, while the second dial varies the time on the main street from 45 to 75 per cent of the total time setting. The two amber periods, red-amber and green-amber, are independently adjustable from zero to 20 seconds. Should the variation of this timer not be great enough, a super-universal timer may be substituted. This timer has a green period adjustable from 10 to 120 seconds, a green-amber from zero to 30 seconds, red from 10 to 120 seconds, and red-amber from zero to 30 seconds. All adjustments are made directly in seconds and independently of each other. The total time-cycle possible is 300 seconds, or 5 minutes.

Tests for Chlorine in Water Simplified

A new piece of equipment which can be used by any layman in easily determining the presence and amount of free chlorine in water, has been developed by the LaMotte Chemical Products Co., McCormick Building, Baltimore, Md. This Enslow chlorine comparator consists of five chlorine color standards, a set of test tubes, distilled water, and a quantity of the chemical for testing. A small measuring pipette is supplied for use with

AN ENSLOW CHLORINE COMPARATOR

the chemical. All this equipment is contained in a polished wooden box approximately 8 inches long, 2½ inches wide, and 5½ inches high. When the top of the case is placed over the tubes and hooked down, the set can be carried from place to place without difficulty. The top of the block contains three slots, and a piece of etched glass is fastened to one side directly over the three slots.

Complete instructions for the use of this set are contained with it and can be easily understood by any superintendent and readily explained to a laborer at a filtration plant or pumping-station.

Flashing Traffic Signals

A new attention-getting flasher which is a self-contained portable unit for installation anywhere without regard to electric power lines, has been developed by the Welsbach Traffic Signal Company, 1934 Market Street, Philadelphia, Pa.

The letters of the Welsbach Ever-Flashing signal during daylight hours appear dark during the periods of the flash and then light up effectively against the background when the flash changes. At night the same signals and slogans again form a contrast as compared with the background of the shield, because the letters and slogans show white during the lighted period of the flash.

THE NEW WELSBACH FLASHING TRAFFIC SIGNAL

Each signal is a complete self-operating unit, current for the lamp and flasher being supplied by four 500-ampere-hour primary batteries. These batteries are contained in a cast iron and concrete base buried below the surface of the ground. This base acts as a firm foundation for the entire unit. The batteries will operate the signal for one year.

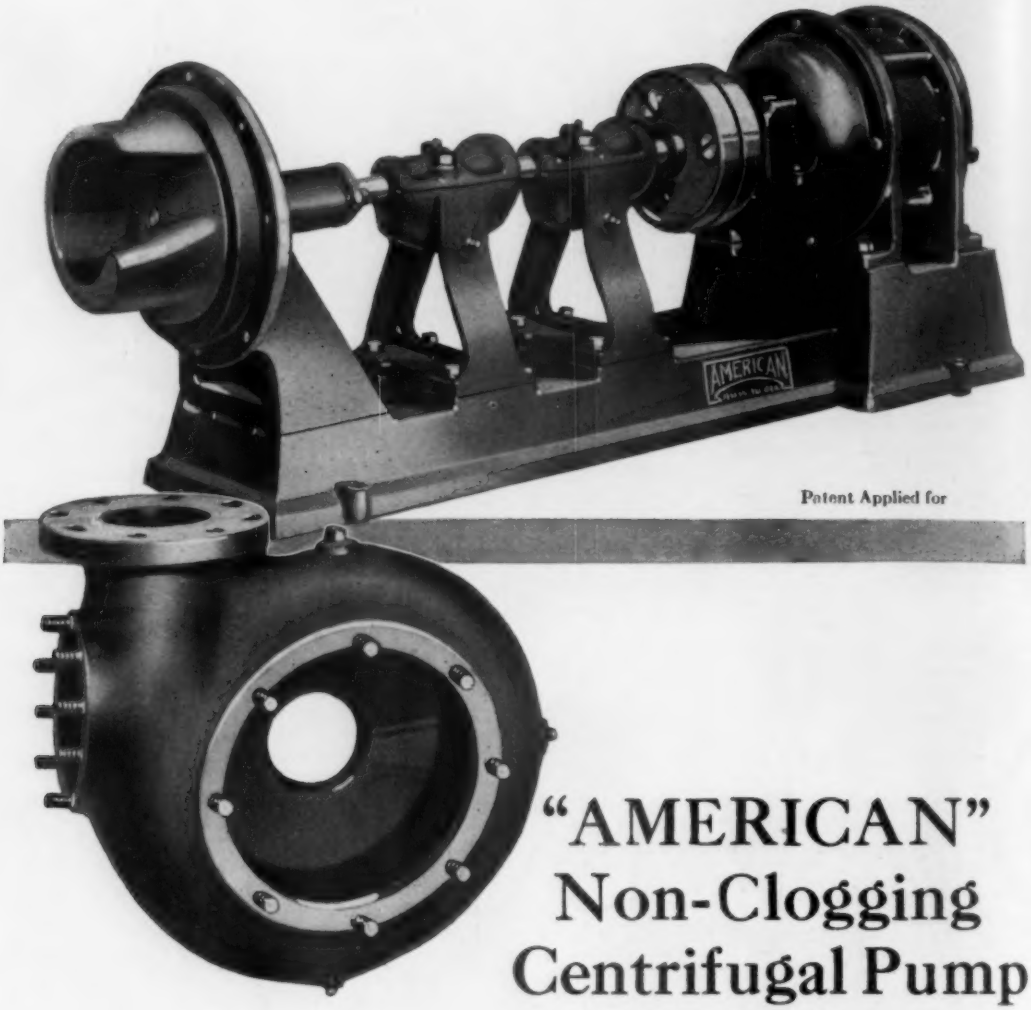
The reflector bowl back of the illuminated glass signal is made of heavy-gage steel formed into proper shape for high reflector value. Three coats of elastic enamel are applied to this bowl, both inside and out. According to the manufacturer, a blow from a rock or a charge of shot will not bend or mar the surface of the bowl.

These signals are made with a glass front with the letters and slogans sand-blasted, or with a steel front with the letters and slogans stenciled through the steel. A special-design railway signal lamp of 0.3 amperes, 3.5 volts is used, insuring long life. The signal flashes continuously day and night, and it is possible to adjust the flash control to any given number of flashes per minute, 60 to 75 being the most efficient.

The company, in addition to installing the signals, will contract to maintain them, thereby insuring service of the highest order. Maintenance includes the replacing of lamps, the recharging of batteries, and the furnishing of parts to replace accidental breakage.

Scaife Moves New York Office

The New York office of William B. Scaife & Sons Co., Pittsburgh, Pa., has been moved from 26 Cortland Street, where it has been for twenty years. The new office is in the Architects Building, at 101 Park Avenue, where metropolitan district sales of the company's various products are handled by H. F. Reynolds, Manager.



Patent Applied for

"AMERICAN" Non-Clogging Centrifugal Pump

Branch Offices:

Chicago, Ill.
1615 First Nat. Bank Bldg.
New York, N. Y.
Room 523—165 Broadway
San Francisco, Calif.
635 Mission Street
Los Angeles, Calif.
420 East Third Street

District Sales Agencies:

Dallas, Tex.	Tulsa, Okla.
Boston, Mass.	Denver, Colo.
Detroit, Mich.	St. Louis, Mo.
Salt Lake City, Utah	
Vancouver, B. C., Can.	
Omaha, Neb.	Charlotte, N. C.
Birmingham, Ala.	Pittsburgh, Pa.
Joplin, Mo.	Roswell, N. M.
Atlanta, Ga.	Philadelphia, Pa.
Jacksonville, Fla.	Kansas City, Mo.
St. Paul, Minn.	

THE "American" Non-Clogging Centrifugal Pump marks a new stage in pump design!

This pump obviates all necessity for the expensive screening of sewage or other fluids containing foreign matter before pumping.

The impeller in the "American" Non-Clogging Centrifugal Pump is so de-

Pictured above is some of the material passed through an "American" 5-inch non-clogging centrifugal pump. The material consisted of old rags, cotton waste, overalls, rubber gaskets, nuts, etc. Some idea of the relative mass of the materials may be gained from the fact that the wooden ball is 4 inches in diameter

signed that the stream lines are not separated, but so that the stream of fluid is kept in one mass and carried through the pump without subdividing the stream.

The difficulty in pumping unscreened sewage or slaughter house refuse is not found in pumping the solids but in the handling of the long stringy materials such as rags, paper, grass, etc. This material clings or lodges against anything in its path in such a manner as to divide the stream in the pump In the past this has necessitated the screening of the sewage or other fluid containing much foreign matter, and it is the maintenance of this screening that is expensive and the source of difficulty.

The "American" Non-Clogging Centrifugal Pump, known as type "NC", is made in both horizontal and vertical types, both of which are equipped with the new type of impeller of the open, single suction type. Additional engineering information is available and will be gladly sent upon request.

THE AMERICAN WELL WORKS

General Offices **AURORA, ILLINOIS** and Factory

BUTLER

THE LARGEST ORDER NEW YORK CITY PLACES

After operating Butler's for a period of three years New York orders ten additional. They find it the most economical, efficient and sanitary. See the Butler in New York, Chicago, Cleveland, Detroit, St. Louis.

THE BUTLER MANU

Mechanical

Plant, 1810 S. 24th. Street,

Cleveland,

Mention THE AMERICAN CITY—it helps.

SWEEPER

FROM THE LARGEST CITY ORDER FOR BUTLERS

FACTURING COMPANY

Sweeping Devices

Ohio

General Offices, 424 Hanna Bldg.

Highly resistant to corrosion

ANACONDA

AN exhaustive ten years' laboratory test has established Anaconda Red-Brass Pipe as the most durable commercial corrosion-resisting pipe for underground pipe lines and for drop lines in artesian wells.

Anaconda distributors are prepared to make deliveries of all standard pipe and special sizes for use with compression fittings.

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Connecticut
Canadian Mill: Anaconda American Brass Ltd.
New Toronto, Ont.

ANACONDA
RED-BRASS PIPE

MORE WATER

Johnson Screens will make your wells efficient.

They allow the greatest amount of water to be developed from wells ending in sand or gravel and will not clog or corrode.

Our catalog sent to any one interested.

Edward E. Johnson, Inc.
2304 Long Ave., St. Paul, Minn.

DONALDSON IRON CO.
EMAUS, LEHIGH CO., PA.

MANUFACTURERS OF

CAST IRON PIPE
FOR WATER AND GAS

ALSO SPECIAL CASTINGS AND FLANGE WORK

Cement Lined Service Pipe

Does not depend on water pressure to hold it in shape.

Is not injured by careless handling or backfilling.

Sixty years' use proves it rustless.

Has no harmful effect on any water.

Now standard in dozens of the most progressive cities and towns. Inexpensive. Uses standard fittings.

Cement Lined Pipe Company
LYNN, MASSACHUSETTS

WATER PURIFYING EQUIPMENT
for
SWIMMING POOLS, INDUSTRIES, ETC.

Send us your problems for solution.

Everson Filter Co.
647 No. Green Street, CHICAGO

Municipal Standpipes
Steel Plate Construction. Welded and riveted pressure pipe in any size.

OVAL METER BOX

Patented self-locking device. Roomy cover, allowing meter to be easily removed.

Write for Booklet

CLARKSVILLE F'DRY & MACH. WORKS
CLARKSVILLE TENN.

IN EMERGENCY

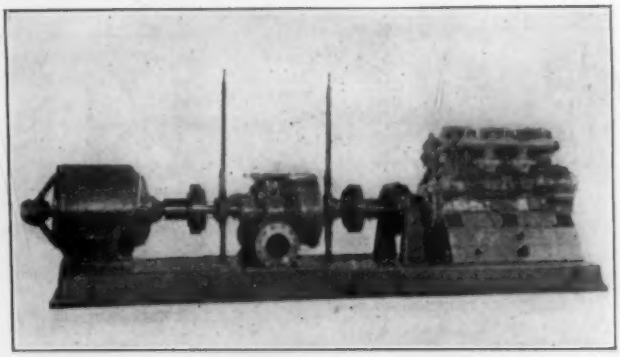
when pumps are down
water is priceless

YOU CAN START INSTANTLY

STERLING INTERNAL **COMBUSTION ENGINES**

Sterling
THE ENGINE OF REFINEMENT

and pump water for three cents a horse-power per hour.



550 G.P.M. against 125 pounds pressure Northern Rotary dual fire pump—Alternate drive, a 150 H.P., 960 R.P.M. GE motor, and a 180 H.P., 1200 R.P.M. Sterling Gasoline Engine.

STERLING ENGINE CO.

Dept. C-11

Buffalo, N. Y., U. S. A.

12 to 300 H. P., 1200 to 1500 R.P.M., $20 to $30 a H.P. Paralleling guaranteed.

NIAGARA AND AMERICAN WATER METERS

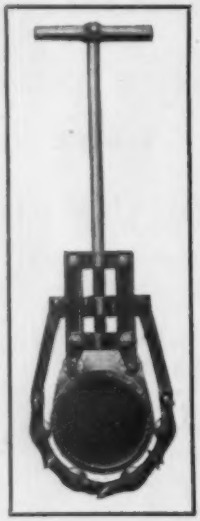
We invite inquiries from water-works which appreciate unusual quality in production and economy in price.

BUFFALO METER CO.

Established 1892

2902 Main St. Buffalo, N. Y.

ELLIS PIPE CUTTER



See the picture:—Every point in contact with the pipe is a cutting disc. Therefore the cutter, when adjusted to the pipe, need be moved only a small part of a circle in order to cut entirely around the pipe.

No. 01 cuts all kinds of pipe 4-in. to 8-in.

No. 1 cuts all kinds of pipe 4-in. to 12-in.

Let us send you one of these pipe cutters on trial.

ELLIS & FORD MFG. CO.

38 Piquette Avenue,

DETROIT, MICH.

Pat. No. 965163

D. & D. Safety and Noiseless Cover

WM. E. DEE COMPANY

80 N. La Salle Street Chicago, Ill.

We manufacture Manhole, Catch Basin and Sewerage Castings of all kinds. We make anything in Gray Iron. Write for our prices.

DIESEL ENGINES

Over 100 in Municipal Service BUSCH-SULZER *Oldest American Diesel Builders*

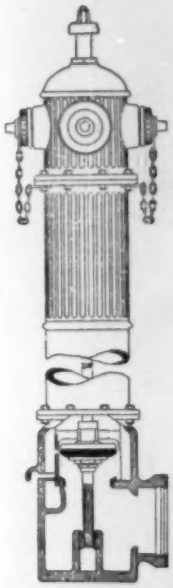
BUSCH-SULZER BROS. DIESEL ENGINE CO., ST. LOUIS, MO.

Do You Want Prices on Anything?

Readers of THE AMERICAN CITY desiring to secure catalogues or price lists on any sort of machinery equipment or supplies for municipal or county work are invited to state their wishes to the Catalog and Price List Department, The American City, 443 Fourth Ave., New York. One letter to us will secure you the information you desire free of all charge, and at a considerable saving of time and correspondence.

The offices of THE AMERICAN CITY, 443 Fourth Ave., N. Y., are headquarters for information on equipment for municipal work. If you want catalogs, prices or names of manufacturers, let us help you.

TRAVERSE CITY FIRE HYDRANTS and GATE VALVES



FIRE HYDRANTS

Designed for hard service.

All working parts removed and replaced by one man.

No flooding of streets should hydrant barrel be broken.

Hose nozzles may be turned and pointed in any direction.

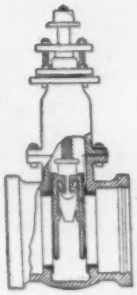
Tobin Bronze forged stems are used in Hydrants.

GATE VALVES

Very simple construction, fewer parts than most valves.

Nut and wedge one solid brass casting.

Tobin Bronze forged stems used in Valves.



TRAVERSE CITY Fire Hydrants and Gate Valves are made in exact accordance with the American Water Works Association Specifications.

TRAVERSE CITY IRON WORKS
TRAVERSE CITY MICH.

270,000 Square Feet of CONCRETE

With Less Than One Square Foot of Patching

There wasn't a square foot of honeycombing all told on the Fletcher Drive Bridge which the Lynch-Cannon Engineering Company of Los Angeles and Salt Lake City recently built for the City of Los Angeles. Not one square foot of harsh surface on 9,000 yards of concrete to suggest a weakened section beneath.

A standard 1:2:3½ mix was used. On the entire job the slump was kept below 3 inches. Three pounds of Celite per bag of cement were employed to promote workability and to prevent segregation.

The Lynch-Cannon Engineering Company are very enthusiastic over the results they obtained with Celite. Their statement that this ultra-fine aggregate more than pays for itself on the basis of improved workability alone is typical of comments which have been made by many leading contractors and engineers who have tried out this material.

Write to Celite Products Company, 11 Broadway, New York, or 53 W. Jackson Blvd., Chicago, or 140 Spear St., San Francisco, for Bulletin K-325 on better concrete

CELITE

Insures Better Concrete at Less Cost

Efficient Pumps
STERLING MADE
can you beat it?

A Deep Well Turbine Pump

That will go in a 4 in. dia. well and deliver 35 gallons per minute against a total head of 80 ft. with 1½ H.P. Motor.

Other Sizes	GPM	Total Head	Horse Power
6 in. Well Pump...	150	75	5
7 in. Well Pump...	200	88	7½
8 in. Well Pump...	350	67	10
10 in. Well Pump...	600	75	15
12 in. Well Pump...	800	75	20
12 in. Well Pump...	1,000	70	25
12 in. Well Pump...	1,200	75	30
14 in. Well Pump...	1,000	128	40
14 in. Well Pump...	1,200	135	50

Pumps for 20 in. Dia. and Smaller Wells

Give Us Your Pumping Problem and we will do the rest.

STERLING Pump Works, Inc.
STOCKTON CALIFORNIA

Flap or Drain Valves
Plug Valves
Sluice Gates
Shear Valves

Coldwell-Wilcox Company
Water St. Newburgh, N. Y.

Pure Water

We manufacture filters for all domestic industrial and municipal requirements.

For over twenty-five years Roberts Filters have been supplying pure, clean water.

Write for descriptive literature.

Roberts Filter Mfg. Co.
DARBY, PA.

INTERNATIONAL
GRAVITY FILTRATION PLANTS

THROUGH the years, the International Filter Co. has been the first to adopt improvements—the first to discard features that have proved hindrances of progress. The result has been that International equipment has maintained its leadership; that it is first now as always.

INTERNATIONAL FILTER CO.
Water Softening and Filtration Plants
Works and General Office; 333 West 25th place, Chicago

New York Pittsburgh San Francisco
Canadian International Filter Co., Ltd., Toronto

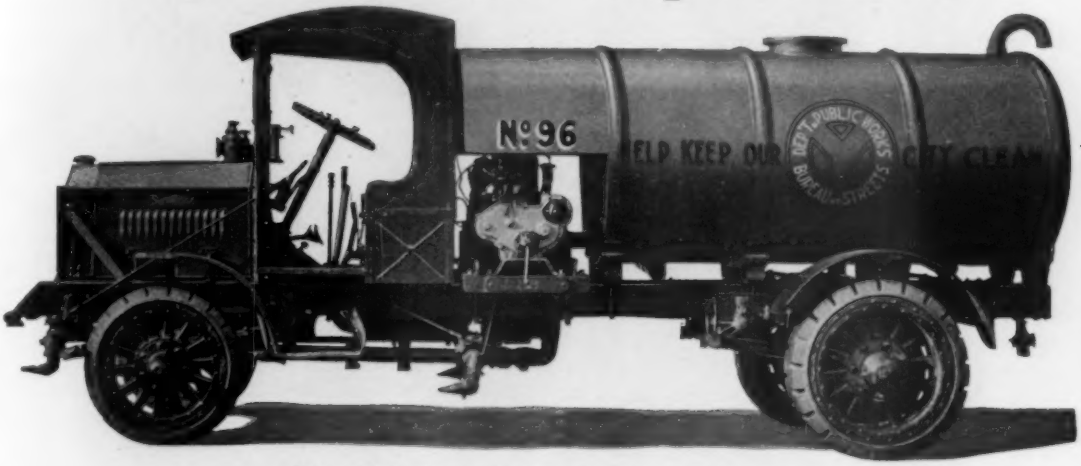
Van Gilder Water Meter
"The Meter with a Conscience"
Runs in Oil.
Lubrication Plus

This meter not only has the gear train running in oil, but even the register itself is submerged in a pure white oil protected by unbreakable glass on a dirt and moisture sealed register box.

Wear proof—Corrosion proof—Always readable

VAN GILDER WATER METER CO.
PLEASANTVILLE NEW JERSEY
"Gateway to Atlantic City"

Why Delay Your Improvements?



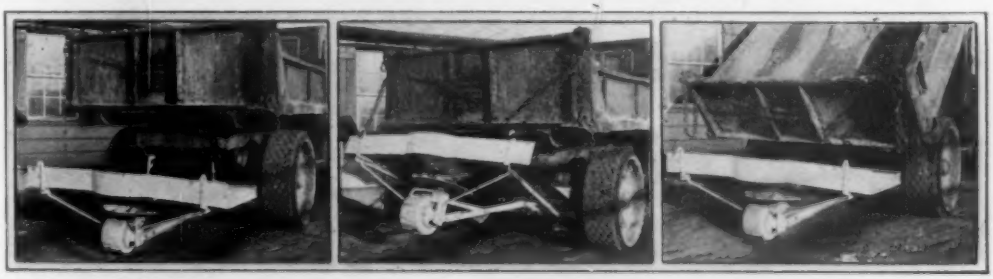
Etnyre Flusher in Use in the City of Chicago

A *flusher in use* is evidence of civic pride and progress.
It means clean, sanitary streets.
This sign on flushing equipment is a *guarantee* of its *highest efficiency.*
Etnyre two-motor system flushing units are built in *sizes* to mount on *any make* and *capacity* of motor truck.

Write for Bulletin No. 301

E. D. ETNYRE & CO., Inc. 55 Jefferson Street, Oregon, Ill.

Manufacturers of FLUSHERS, SPRINKLERS and DISTRIBUTORS
New England Office: 11 Beacon St., Boston, Mass., G. E. Pearson, Mgr.



ONE GOROCO SPREADER

—with only two men, does the work of twenty
—spreads at one-tenth the cost of hand labor
—and does it better!

The Goroco Spreader will spread any loose aggregate, screenings, stone or slag chips, gravel, sand or cinders, evenly, to a width of from six to twenty feet. It is easily transported to the next job by raising it against the end gate of the truck.

Write for Circular

GOROCO MECHANICAL SPREADER CO.

UPPER DARBY P. O.
PHILADELPHIA, PA.

Over 1200 Owned by the City of New York

THAT'S the record of Van Dorn hoist and dump body units in America's largest municipality.

Built for every type of municipal work—garbage collection, street cleaning, general hauling—Van Dorn hoist and body units do their particular job in less time, with less labor and at a smaller operation cost.

That's the reason they are always selected by America's largest municipal buyer—why Van Dorn is the largest builder of municipal dump truck bodies and hoists in the world. Fully descriptive literature will be sent on request.

THE VAN DORN IRON WORKS COMPANY
Truck Division, 2685 East 79th Street, Cleveland, Ohio

Van Dorn
MASTERCRAFTSMANSHIP IN STEEL

SULKY DERRICKS

DOBBIE EQUIPMENT
FOR
WATER WORKS CONSTRUCTION

The Pick-Up Cart, for moving the material to the trench, and the Sulky Derrick to place the material, are great time-and-money savers in handling pipe, timber, sewer and water-works castings, etc. Let us send you our booklet.

PICK-UP CART

DOBBIE FOUNDRY & MACHINE COMPANY
NIAGARA FALLS, N. Y.

One-Fifth the Weight of Cast Iron Pipe
One-Third the Weight of Wrought Pipe

An Absolutely Tight Durable Pipe

50% stronger than Straight Riveted Pipe of equal thickness. Light weight and simplicity of bolted connections results in low handling and installation expense. "Especially suitable for well field installations, intake, flow and distribution lines," sizes 6 in. to 30 in.

ABENDROTH & ROOT MFG. CO.
Sales Offices: Woolworth Bldg., N. Y.
Pipe Specialists Continuously Since 1867

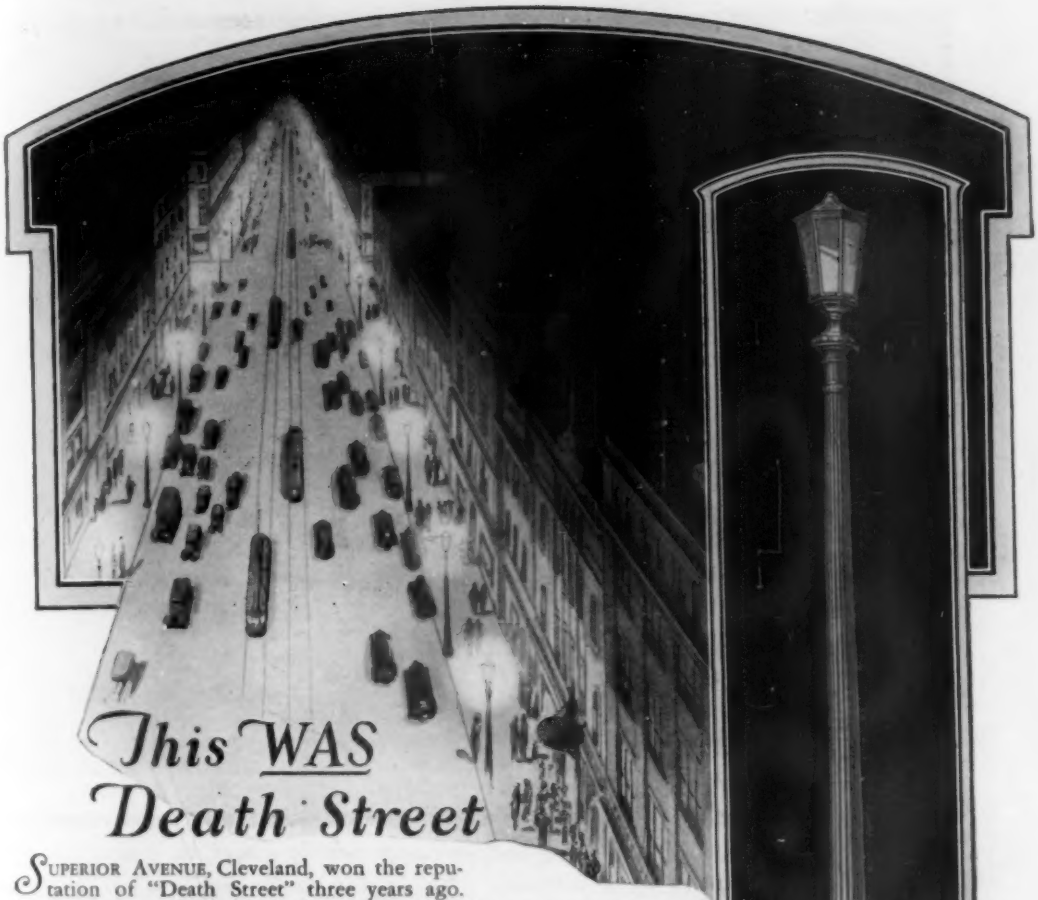
ALDRICH

THE ALDRICH PUMP COMPANY
No. 3 GORDON STREET
ALLENTOWN, PENNA.

REPRESENTATIVES WANTED

Single Suction
Double Suction
CENTRIFUGAL
Single Stage
Multi Stage

PUMPS



This WAS Death Street

SUPERIOR AVENUE, Cleveland, won the reputation of "Death Street" three years ago. Traffic accidents claimed eight lives in one short year on this poorly lighted thoroughfare. Then Union Metal Lighting Standards and high intensity lamps were installed.

The daylighting of this dark street immediately changed it from death street to safe street. In the many months since this installation was turned on, not one fatal accident has occurred on Superior Avenue.

Today, this street carries a much greater traffic load; relieving choked Euclid Avenue. More vehicles make better time with greater ease, real estate values have gone up, the street is well-dressed and attractive.

Let Union Metal Engineers show you the "Right Way for Your White Way" just as they have in Cleveland and thousands of other cities throughout the world.

THE UNION METAL MANUFACTURING CO
General Offices and Factory, Canton, Ohio
Branches—New York, Chicago, Philadelphia, St. Louis, Los Angeles, San Francisco, Jacksonville.

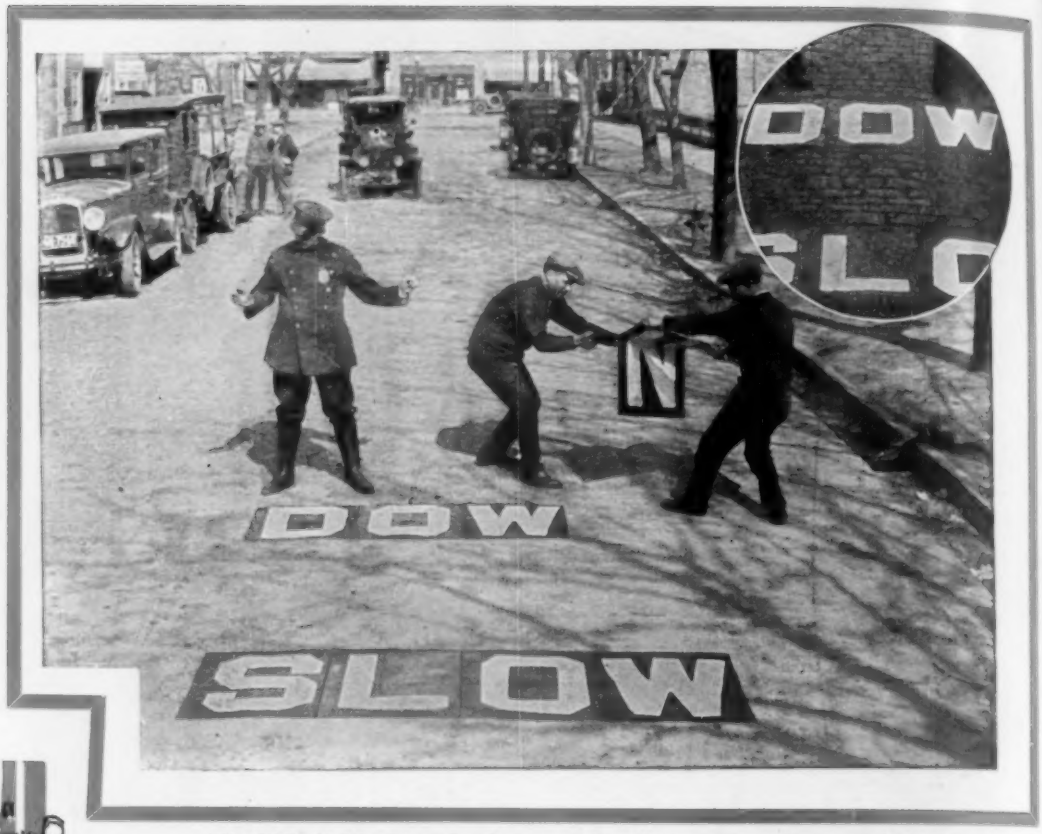
If you are interested in making your city brighter, safer and more beautiful, send for this new booklet which explains why Union Metal Lighting Standards are the outstanding choice of careful buyers throughout the world.

Union Metal Standard Design No. 2385 equipped with General Electric Novalux Lantern No. 23-B as used on Superior Ave., Cleveland.

UNION METAL

THE ORIGINATORS AND LARGEST PRODUCERS OF

ORNAMENTAL LAMP STANDARDS



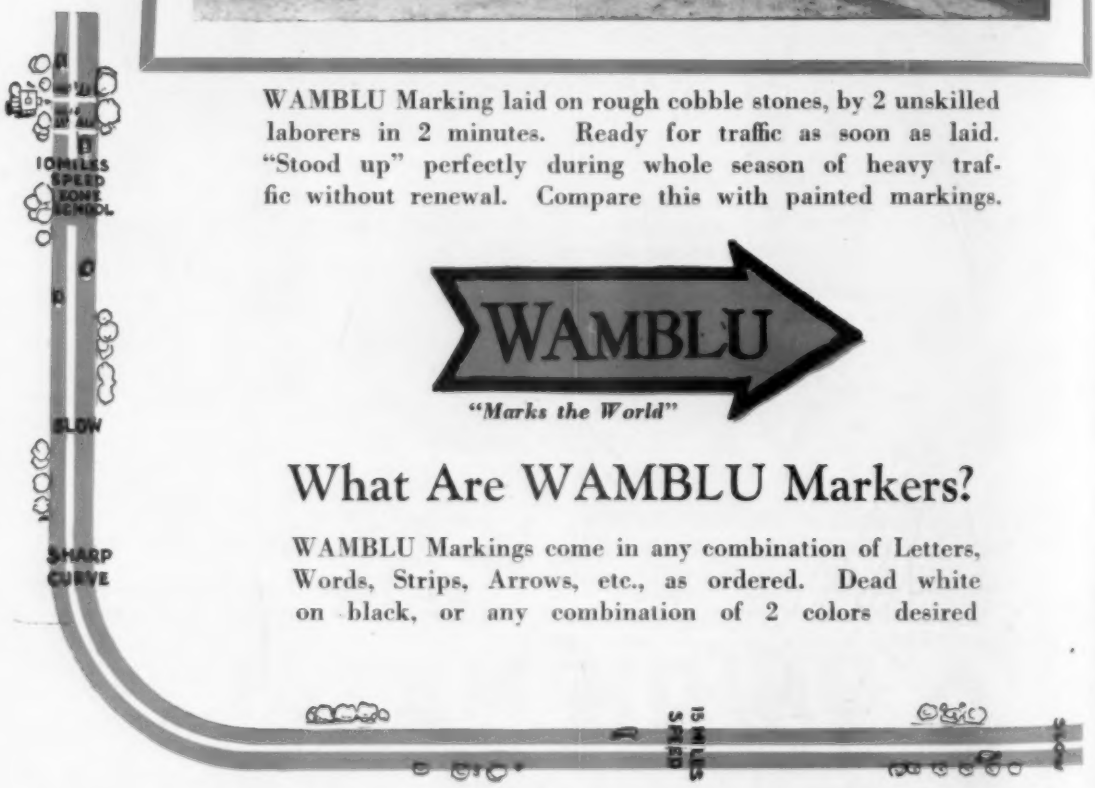
WAMBLU Marking laid on rough cobble stones, by 2 unskilled laborers in 2 minutes. Ready for traffic as soon as laid. "Stood up" perfectly during whole season of heavy traffic without renewal. Compare this with painted markings.

WAMBLU

"Marks the World"

What Are WAMBLU Markers?

WAMBLU Markings come in any combination of Letters, Words, Strips, Arrows, etc., as ordered. Dead white on black, or any combination of 2 colors desired



Do you mention THE AMERICAN CITY when writing? Please do.

BETTER TRAFFIC MARKING

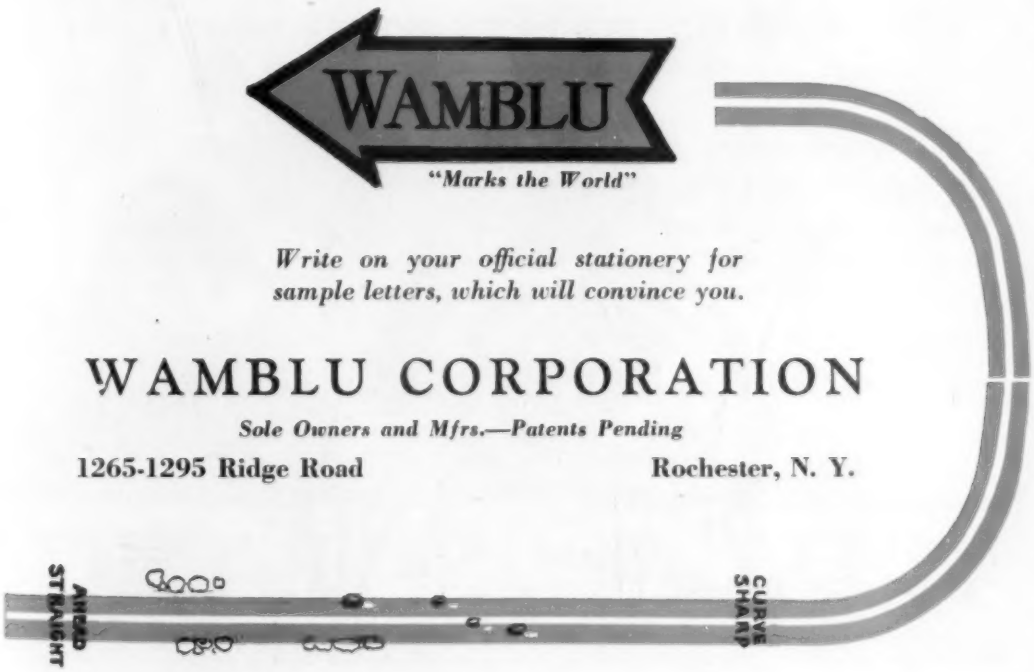
With Less Time—Less Delay—Less Renewal and a Big Saving in Cost

Unskilled men with WAMBLU Simplified Safety Traffic Letters, Strips, Arrows, etc., put down markings that are far superior to paint in appearance, visibility and durability.

Finished in minutes, against hours for hand painting.

No blocking off streets. No waiting for paint to dry. No delays to traffic—wheels roll over WAMBLU as soon as it is laid.

WAMBLU Letters and Markers are tough fabric, coated on backs with our GUM adhesive—self-vulcanizing to any surface. They "set" instantly and remain highly visible for months under heaviest traffic.

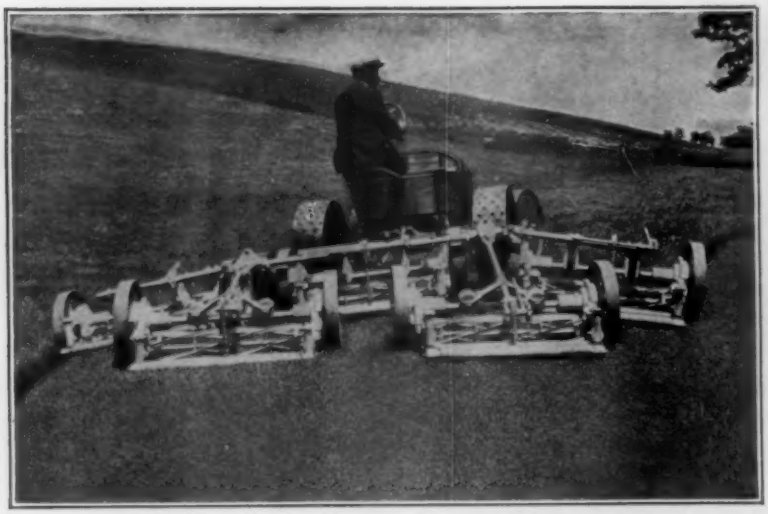


Write on your official stationery for sample letters, which will convince you.

WAMBLU CORPORATION

Sole Owners and Mfrs.—Patents Pending

1265-1295 Ridge Road **Rochester, N. Y.**



When QUALITY Counts Most

It is during the long, hard days of the summer that PENNSYLVANIA Quality more than justifies itself to the busy Park Executive.

Then, for instance, the sturdy Super Fairway Quint shows best, not only its speed and efficiency, but its ability to stand the "gaff" and stay on the job. Because every moving part of the Super Fairway Quint is roller-bearing (even the ground rollers), all its knives are of the finest crucible tool steel, oil hardened and water tempered, and its lubrication throughout is Alemite. It is a stranger to the repair shop.

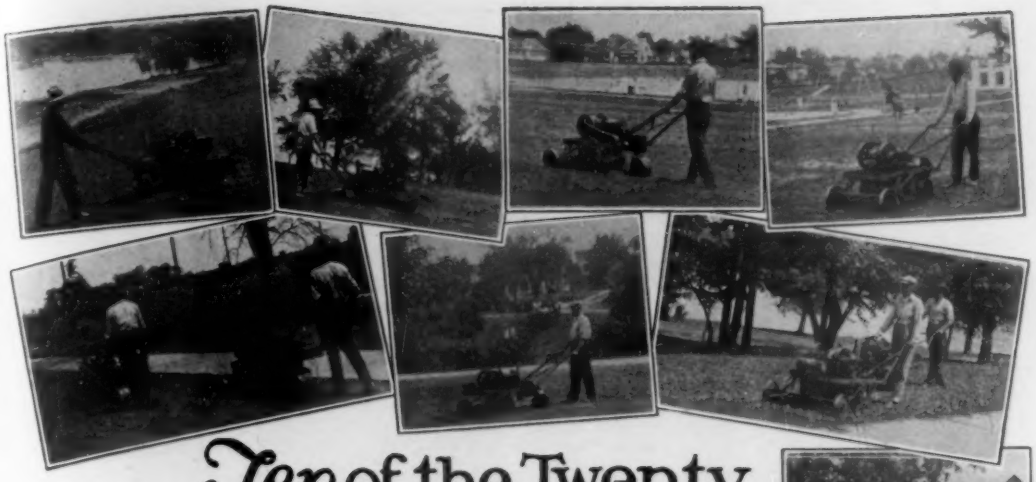
Write for your copy of attractive catalog describing fully the Super Fairway, the Super Roller Greens Mower and all the other PENNSYLVANIA Mowers for Public Parks and Golf Courses.

PENNSYLVANIA LAWN MOWER WORKS

1615-35 North 23rd Street, Philadelphia, Pa.

The Super Roller Greens Mower has been still further improved for 1927.

PENNSYLVANIA
Quality
LAWN MOWERS

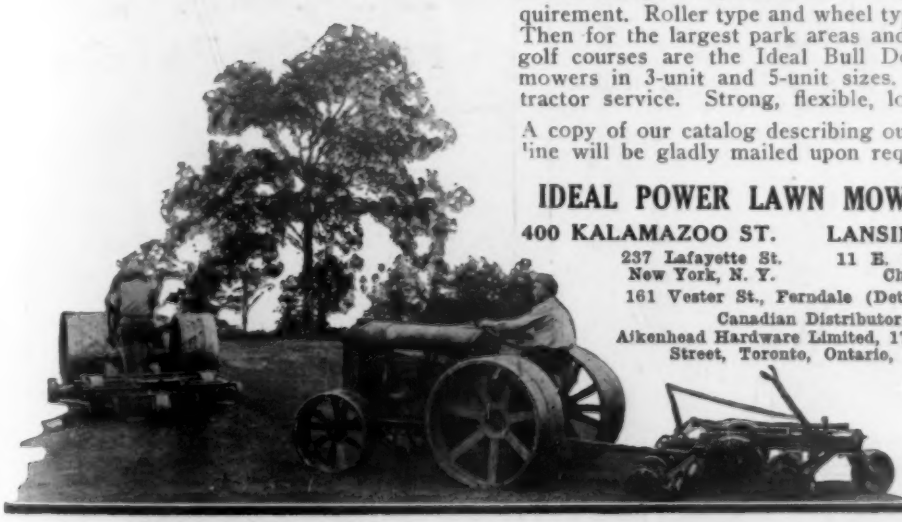


Ten of the Twenty Ideal Mowers Used By the Minneapolis Park Dept.

Park Superintendents in many cities look upon the Ideal Power Mower as the most dependable unit of their grass-cutting equipment.

These sturdy, simple, and reliable Ideals are built in four sizes: 20-inch, 22-inch, 25-inch, and 30-inch, in capacities for every park requirement. Roller type and wheel type mowers. Then for the largest park areas and municipal golf courses are the Ideal Bull Dog fairway mowers in 3-unit and 5-unit sizes. Built for tractor service. Strong, flexible, long-lived.

A copy of our catalog describing our complete line will be gladly mailed upon request.



IDEAL POWER LAWN MOWER CO.

400 KALAMAZOO ST. LANSING, MICH.

237 Lafayette St. New York, N. Y.
11 E. Harrison St. Chicago, Ill.
161 Vester St., Ferndale (Detroit), Mich.

Canadian Distributors:
Aikenhead Hardware Limited, 17 Temperance Street, Toronto, Ontario, Canada

IDEAL GRASS CUTTING EQUIPMENT

MITCHELL

"BETTERBILT" PLAYGROUND APPARATUS

THE BETTERBILT LINE OF

Merry Whirls
Swing a Rounds
Swing Bobs
Pedo Swings
Settee Swings
Teeter-Totters
Slides
Water Slides
Frame Swings
Kiddie Whirls
Porch Swings
Lawn Swings
Horizontal Ladders
Etc., Etc.

The MERRY WHIRL accommodates 1 or 50 children at a time and gives them the best of exercise all the year around. Safe, strong and neat in appearance.

Send for Catalog No. 11.

MITCHELL MANUFACTURING COMPANY

1300 - 29th AVENUE -:- MILWAUKEE, WISCONSIN

Drive to the Job and Start Pumping

WATER out in a hurry at lowest cost—that's the job a Barton does well. Greatest ditch and drainage pump ever perfected—saves time—saves money—thousands in use. Merely attach to front of any car, and engine supplies power through patented take-off. Automatic primer exclusive feature—primes and reprimes without attention. Made in four sizes—capacities to 900 G.P.M. Don't buy expensive equipment until you get the facts on this pump.

Write for Bulletin 56

AMERICAN STEAM PUMP COMPANY
BATTLE CREEK, MICHIGAN

BARTON
PORTABLE PUMPS

DIXON'S
Graphite Paints

Better and longer protection as well as lower cost per year of service are direct results of their use.

The pigment, flake silica-graphite, is unusual in its durability and water-repellent qualities. Being of flake formation, it expands and contracts with temperature variation without cracking or peeling.

Write for new color card No. 7-B, showing colors of aluminum and Light Gray.

JOSEPH DIXON CRUCIBLE CO.

Jersey City New Jersey

1827 ONE HUNDREDTH ANNIVERSARY 1927

RECREATION EverWear APPARATUS

NO. B-225 MERRY-WAVE-STRIDE

The EverWear Merry-Wave-Stride (Patent Applied For) is a brand new feature for the Park and Playground, *instantly suggesting its own use* and proving most attractive to both children and adults.

From fifteen to twenty can use it at one time. It is safe and strong; stands twelve feet high and is ten feet in diameter, thus occupying *small* ground space.

The EverWear line of Playground Apparatus is large and complete and incorporates patented safety devices which make it distinctive.

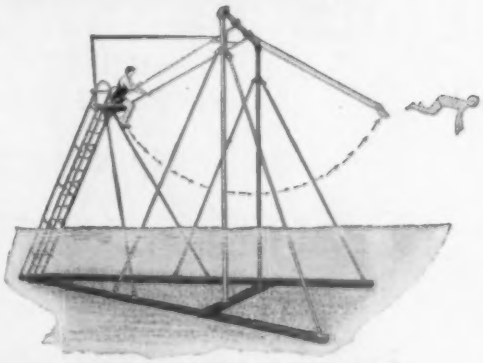
EverWear

PLAYGROUND AND WATER APPARATUS

The EverWear Poised Safety Swing Diving Outfit (Patent Applied For) is a splendid new feature for the swimming place.

The Diver *sits* on the stiff-pipe-suspensioned swing seat and—*when he is ready* —presses on the foot lever—the trap is sprung—and he drops in a wide arc to project himself in a long thrilling dive.

If he does not want to dive on the first swing—*he can stay on* "until the old cat dies" if he desires. The swing returns to the trap for the next diver and —so on—without end.



NO. D-600 POISED SAFETY SWING DIVING OUTFIT

The EverWear Line of Water Apparatus is large, complete and distinctive.

Write for the new complete EverWear Catalog No. 19.

THE EVERWEAR MANUFACTURING CO.

SPRINGFIELD, OHIO

Whirl-Over Swing Co., Inc.

CHICKASHA, OKLA.

If the Whirl-Over Swing *is installed in any playground, that's the most popular place in the playground.*

The children ride by turns, and *"I'm next"* is the chant from morning until night wherever the *children* are at play. Safety is its best feature. It lasts a lifetime, and is very healthful for children.

Write for further information and list of users. Salesmen wanted. The season is now on.

PARK BENCHES AND SWINGS

NINE DIFFERENT STYLES OF

BAUSMAN BETTER BENCHES

AND

THE HEAVY PARK SWING

Designed for Comfort, Appearance and Durability; Made from Materials of Quality and Backed by an Experience of More Than a Quarter of a Century.

There is a Bausman Bench for Every Purpose.

BAUSMAN MFG. CO. MILLERSVILLE, PA.

BENCH MAKERS FOR MORE THAN A QUARTER OF A CENTURY

MEDART
Playground Equipment in HONDURAS

Even in tropical Honduras you will find Medart Playground Equipment—the universally accepted standard. The illustration shows school children of the Evangelical Mission, San Pedro hula, using the slide, and they use it diligently throughout the day. After sundown, when the shadows of nights are falling, the adults sneak over to the schoolyard and use the slide themselves.

This Medart slide has furnished so much enjoyment to the community that the people are planning to install more playground equipment. It is but natural for them to select MEDART equipment—it is the first choice for Safety, Service, Durability, Economy—the first choice of those who have the welfare of the children and the community at heart.

The Medart Playground Catalog illustrates and describes the entire Medart line. Your copy is waiting for you—may we send it? Let us know today.

FRED MEDART MFG. CO.

3576 DeKalb Street **St. Louis, Missouri**

New York, Pittsburgh, Philadelphia, Cleveland, Detroit, Chicago, Kansas City, San Francisco, Los Angeles

DeLuxe

Excelite

A Question of Figures

PREMAX DeLuxe house numbers of satin-finished aluminum make identification a simple matter by day or night, and give character and individuality to homes and city alike.

The attractive appearance and high visibility of these easily read 2½-inch figures—each recessed on its black enameled placque—is highly appreciated by both residents and visitors.

Our comprehensive portfolio on the numbering systems of representative American cities is yours on request. Return the coupon below for detailed descriptions.

PREMAX
HOUSE NUMBERS

NIAGARA METAL STAMPING CORP.
Dept. AC-6 Niagara Falls, N. Y.

Please send me your portfolio on Modern House Numbering Methods.

Name .....
Address .....
City & State .....

ORNAMENTAL STREET STANCHION

CATALOG ON REQUEST

HORNI SIGNAL MFG. CORP.
183 Varick St. New York City

"Dim your lights"

There is one automobile for every 5.4 persons in the United States. When the highway lighting in your community permits motorists to drive with headlights dimmed—then you have increased the safety of thousands.

The road from St. Petersburg to Tampa was shortened 26 miles by the Gandy Bridge. Each night, 2000 cars, with headlights dimmed, follow this five-mile "highway on the sea"—and G-E Novalux Units light the way.

The nearest G-E Sales Office will gladly give you full information on G-E Novalux Highway Lighting installations. In proportion to results accomplished and the number of people served, lighting is the most economical form of highway improvement.

720-54

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

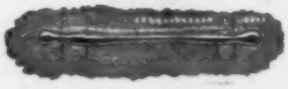
for IMPROVED BRASS STREET SIGNS

also Warning Signals and Traffic Markers for Every Use

Write for the Catalog of the

UNION IRON PRODUCTS COMPANY

East Chicago Indiana



Bi-Lateral Fire Hose construction keeps the rubber from cracking or leaking. If you want the best fire hose at the lowest cost per year of service, send for our catalog.

BI-LATERAL FIRE HOSE CO.

230 West Randolph St. Chicago, Ill.

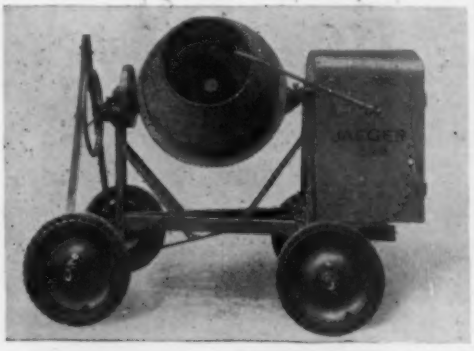
The Breakers

ATLANTIC CITY

Preferred—in Spring and all seasons—by those who know and want the best... either upon the American or European plan... and sensible rates withal.

Health Baths, Golf privileges, Orchestra, Dancing. Garage on premises.

JOEL HILLMAN, President
JULIAN A. HILLMAN, V.-President



78 Sold in One Order to New York State Highway Dept.

JAEGER MIXERS

The Jaeger Tilter is the World's largest-selling mixer not because of its moderate price, but because it outwears and outmixes any mixer of equal size.

BUILT IN ALL SIZES — ½- to 3-BAG

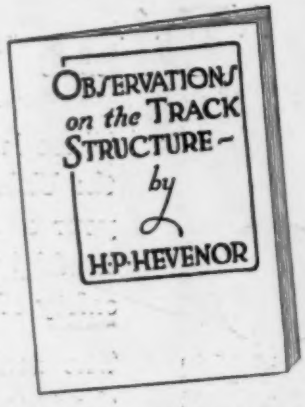
Low Chargers—Power Loaders—Pavers

WRITE FOR CATALOG AND PRICES

THE JAEGER MACHINE COMPANY

215 Dublin Rd. COLUMBUS, OHIO

Offices and Service Stations in All Principal Cities



A Consulting Engineer on Paved Track in City Streets—

A non-technical discussion by a track specialist of the relative merits of various designs of modern paved track construction

We will be pleased to mail a copy of this booklet to interested Mayors, City Engineers or other officials

THE INTERNATIONAL STEEL TIE COMPANY

16702 Waterloo Road Cleveland, Ohio

ELRECO POLES

and Brackets

---four popular styles of this most popular line

Elreco Bracket No. 19461 *for supporting General Electric form* 8 *Novalux unit.*

Elreco Bracket No. 10470 *for supporting General Electric form* 12 *Novalux unit.*

Elreco Bracket No. 10465 *for supporting General Electric form* 9 *Novalux limit.*

Elreco Bracket No. 11087 *for supporting General Electric form* 19 *Pendent Lantern.*

THE ELECTRIC RAILWAY EQUIPMENT COMPANY

30 Church Street, New York — CINCINNATI, OHIO

LOVELLITE

TRAFFIC SIGNALS

MEET THE DEMAND
OF
The Small Town
AS WELL AS
The Big City

F. H. LOVELL & COMPANY
Highway Traffic Signal Dept.
ARLINGTON, N. J.

Lamp Posts

Service Boxes

Valve Boxes

Write for Prices
&
Complete Lighting Catalog

The Casey-Hedges Co.
Chattanooga, Tenn.

ALUMOYD TRAFFIC SIGNS
ROADPILOT—THE IMPROVED REFLECTING SIGNAL

Street Signs
Zone Markers
Direction Signs
Highway Markers
Etc.

All Castings of Special Alloyed Aluminum

Write for Catalog and Prices.

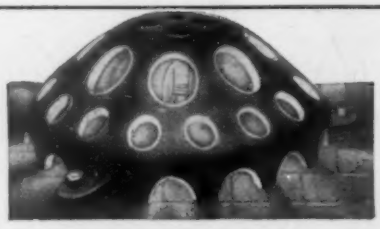
Alumoyd Sign & Signal Co.
Formerly
Automatic Signal & Sign Co.
Michigan at 11th St., Chicago, Ill.

INEXPENSIVE PARKING SIGNS

We can furnish you with a two-face, baked enamel, embossed sign, in patented holder, with pole bracket, for $4.70! And it is the most attractive outfit made—and extremely durable.

Send for our handsome catalog on Street Signals, Standards and Parking Signs. It is free!

ROCHESTER STREET SIGNAL CO.
400 Ward Bldg. Rochester, N. Y.



THE COLUMBUS TRAFFIC GUIDE
Low Down—Dual Electrical Illumination
See Page 337—1927 Municipal Index
Traffic Signs, Street Name Signs
OHIO TRAFFIC DEVICES COMPANY
379 Midland Ave. Columbus, Ohio

Do you mention THE AMERICAN CITY when writing? Please do.

CONTROL DEVICES FOR ELECTRIC TRAFFIC SIGNALS

Complete information will be furnished upon request.

CROUSE-HINDS COMPANY

ESTABLISHED 1897

SYRACUSE, N. Y., U. S. A.

Sales Offices

NEW YORK
PHILADELPHIA PITTSBURGH DETROIT CINCINNATI CLEVELAND ATLANTA
BOSTON
CHICAGO
ST LOUIS SAN FRANCISCO MINNEAPOLIS MILWAUKEE

CH 294

Signs That Never Wear Out

Aluminite Signs are made for Permanent Satisfactory service. Made in a wide range of styles and sizes for a variety of uses. Cast from a special aluminum alloy that will never rust nor corrode and will not deteriorate from outside exposure. Substantial, easily readable, beautiful and economical. New catalog, completely illustrated, free on request.

Everlasting Signs

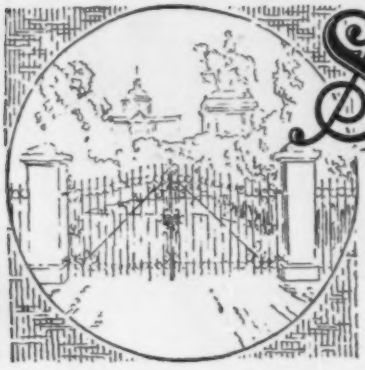
Standard Manufacturing Co.
CEDAR FALLS, IOWA

Water Properties

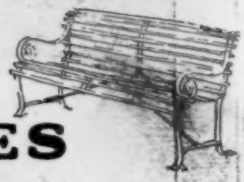
PURCHASED OR SOLD

Confidential Commissions
Executed with Discretion

THOMAS R. CONDON
231 S. La Salle St. Chicago, Ill.



Stewart FENCES



Park and Playground fencing has been a specialty with Stewart for many years. It has the stand-up-ability which makes it a good investment. There's unequaled variety in the Stewart line, too. Let us send the Catalog.

Let us quote on your requirements in Park Settees.

The Stewart Iron Works Co., Inc.
216 Stewart Block Cincinnati, Ohio

A Lithoprint

LOOKS LIKE A LITHOGRAPH
COSTS LIKE A BLUE PRINT

LITHOPRINTS are ink reproductions on any material of

TRACINGS - MAPS - PLANS

Bulletins of special interest to Architects, Engineers & Manufacturers sent on request

LITHOPRINT COMPANY of NEW YORK, Inc.
41-48 Warren Street, New York, N. Y

BRAXMAR BADGES

Police, Fire and Municipal Badges in all Metals—Fully Illustrated Catalog.

C. G. BRAXMAR CO., Inc.
242 West 55th St. New York

Write for Catalogs

MUNICIPAL BADGES
LICENSE PLATES

The
C. H. HANSON COMPANY
178 No. Clark St.
CHICAGO, ILL.

What is your Problem?

Type R D
Post Mounted

ESSCO Traffic Systems provide a permanent solution to the traffic problem, whatever it may be. There is an ESSCO system to fit every need, from the smallest to the largest city.

Bring your traffic problems to us. We will gladly make a study of conditions and have our engineers make a personal survey.

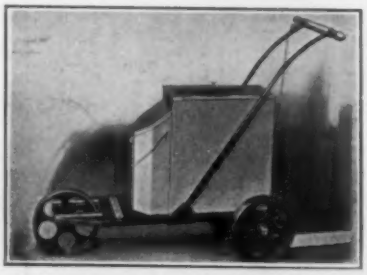
And bear in mind—all ESSCO equipment is fully guaranteed.

ESSCO MFG. CO.
116 Harrison St.
PEORIA ILLINOIS

Type R D
Center Suspension

ESSCO
Traffic Control
SYSTEMS

LINE-O-GRAPH



Highway Marking Machine

For Painting

SAFETY

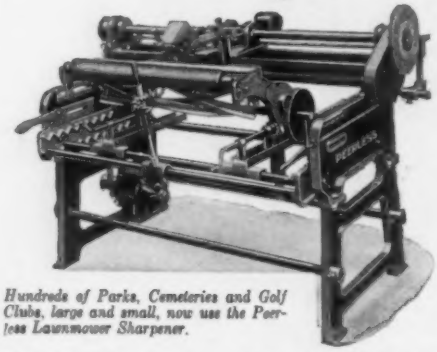
Dangerous Curves
Safety Zones
Parking Spaces
Street Crossings

Operated by one man, does away with brushes, eliminates all hand-painting, marks with any kind of highway paint, makes perfect lines on any pavement.

THE LINE-O-GRAPH CO.

Factory: Yonkers, N. Y. 17 E. 42nd St., New York City

The Peerless Lawnmower Sharpener



Hundreds of Parks, Cemeteries and Golf Clubs, large and small, now use the Peerless Lawnmower Sharpener.

The Peerless Lawnmower Sharpener is the only machine that sharpens all makes of Power, Horse and Hand Mowers **scientifically—quickly—perfectly**—doing the work as nothing else can. Special Grinding Wheel Attachment for sharpening grass shears, sickles, scythes, etc. Skate Sharpener Attachment sharpens all makes of skates—including hockey. Earns money all the year round. Hundreds of clubs—both large and small—now use the Peerless. Will save its cost the first season. Write for catalog and list of users.

THE FATE-ROOT-HEATH COMPANY
808 Bell Street Plymouth, Ohio

A STRICTLY PERMANENT SIGN SPEAKS FOR ITSELF

Sign posts are now available with all EVERNU Signs. These posts will always appear new, for they are covered with a seamless aluminum tube that will never require refinishing because of the weather wear. Furthermore, the life of the post is extended beyond the ability to estimate, for when set in concrete there is no part of the steel post exposed to the weather, hence no corrosion and no upkeep expense.

If you would like to improve the appearance of your city and work out an economy at the same time, install EVERNU Permanent Signs.

Catalog shows many designs

The Evernu-Century Sign Co.

100 Colonial Road Boston (Brighton), Mass.

NO DEPOSIT REQUIRED

Express Charges Prepaid

Pat'd

"Sterling" Convertible Level—Model No. 40.

You may have the "STERLING" Convertible Level sent you for a **10-day free trial** without expense or obligation to purchase. Don't buy until you have SEEN and TRIED the Level which was awarded the GOLD MEDAL at the Sesqui-Centennial Exposition—1926.

Used by Municipalities for street and sewer work. Return the coupon for details.

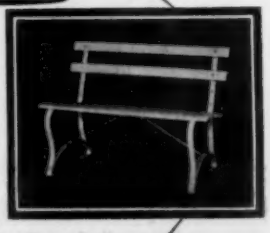
WARREN-KNIGHT CO.
136 N. 12th St. Philadelphia, Pa.

Send me your free bulletin VL-6, describing the "Sterling" Convertible Level and giving details of free trial offer.

Name .....

Address .....

Logan Settees

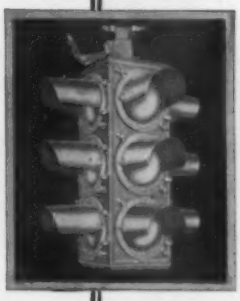


Made for hard usage, long life and real comfort in many styles for every conceivable purpose. Big-volume production means lowest possible prices.

Write today for descriptions and price list.

Logan Co., *Inc.*
(Formerly The Dow Co.)
310 N. Buchanan St.,
Louisville, Ky.

3 Features of the CHRONOPLAN SYSTEM of Traffic Control



A typical, commonly used unit of the CHRONOPLAN System. Tokheim Traffic Control Signal, Cut 1200, Four Way Aerial Type.

—moves traffic efficiently!

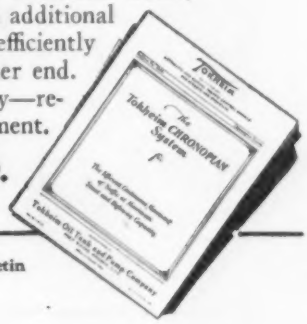
The control and movement of traffic is efficient only when the minimum amount of time is utilized in stopping and starting a group of cars. The CHRONOPLAN System obtains this objective in individually compensating blocks of unequal length and intersections subject to varying amounts of cross-traffic.

—continuously!

With the time cycle set up to permit traffic to move at a certain safe speed per hour, and with blocks of unequal length and intersections subject to varying amounts of cross-traffic individually compensated—the Tokheim CHRONOPLAN System moves traffic continuously. It naturally follows that the main artery under control becomes a veritable "through" street, on which a group of cars, or groups of cars, seldom need stop.

—at maximum street capacity!

Once the Tokheim CHRONOPLAN System begins functioning, the thorofares, heretofore crowded and jammed with vehicular traffic, automatically clean themselves; no matter how much additional traffic pours into the main artery from one end it is efficiently and continuously passed through and out at the other end. Thus the streets are utilized at maximum capacity—returning tremendous dividends on their original investment.



TOKHEIM OIL TANK & PUMP CO.
Fort Wayne, Indiana

Write Department "M" and ask for FREE copy of the CHRONOPLAN Bulletin

EASY to see, and HARD to beat—for

Reliability and Durability

The Lehman Traffic Guide

Write for our illustrated folder

Elkhart Foundry & Machine Co.

Elkhart, Indiana

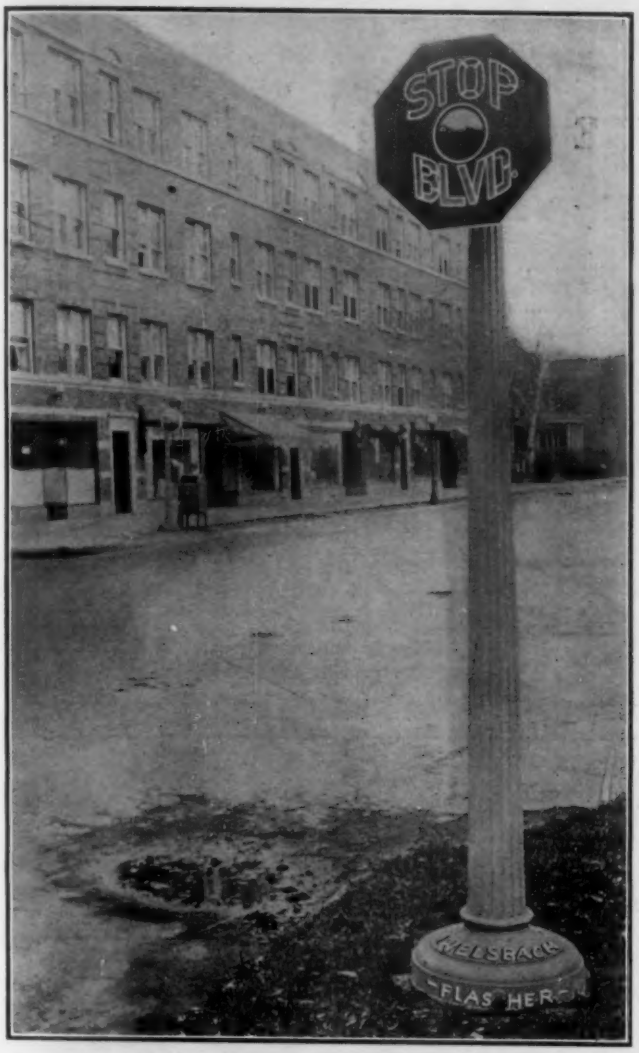
Marion "PARKWAY" Steel Taped Cables

With the DOUBLE STEEL strip giving DOUBLE LIFE in all Voltages in Single, Duplex, and Triplex Conductor. Also Lead-Covered, Traffic-Control and Fire-Alarm Cables.

MARION INSULATED WIRE & RUBBER CO.

Factory—Marion, Indiana

Chicago	Indianapolis	New York	Los Angeles
215 N. Desplaines St.	Odd Fellows Bldg.	171 Madison Ave.	A. S. Lindstrum Co.



ANY SLOGAN DESIRED

EVER-FLASHING
ELECTRIC
TRAFFIC SIGNALS

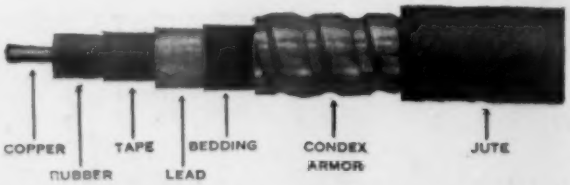
TRAFFIC
CONTROL

WELSBACH

TRAFFIC SIGNAL COMPANY

1934 Market St., PHILADELPHIA - - Peoples Gas Bldg., CHICAGO

CONDEX
PARK CABLE



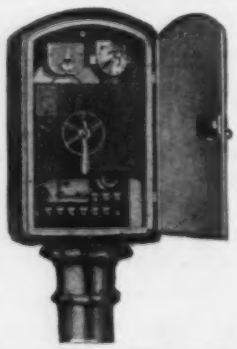
Five Reasons Why You Should Investigate Condex

CONDEX Park Cable is intended for use on series lighting circuits for municipal street lighting, white way installations and for park or playground illuminating systems.

CONDEX consists of an insulated conductor, lead covered, and protected by an interlocking steel tape, under and over which is a bedding saturated with a preservative compound. When you are considering new lighting systems investigate CONDEX because:

1. CONDEX lowers first cost by making conduits unnecessary.
2. It is easy to install.
3. It is protected by an interlocking steel tape which guarantees complete coverage and offers unusual resistance to crushing.
4. CONDEX is dependable because it cannot be harmed by storms.
5. A CONDEX installation properly installed will last for years.

SIMPLEX WIRE & CABLE Co
MANUFACTURERS
201 DEVONSHIRE ST., BOSTON
CHICAGO SAN FRANCISCO NEW YORK
CLEVELAND JACKSONVILLE



MUNICIPAL SIGNAL & EQUIPMENT CORP.
Specialists in
TRAFFIC CONTROL
and
FIRE ALARM AND POLICE SIGNAL EQUIPMENT
5 BEEKMAN STREET NEW YORK CITY

BUFFALO-SPRINGFIELD
ROLLERS

All Types and Sizes
With or without Scarifier attachment.
Helps you finish the job on time.

Send for Catalog A *for complete information*

The Buffalo-Springfield Roller Co. SPRINGFIELD OHIO

Permanent Traffic Lines
Monel Metal Markers

NATIONAL Traffic Markers will remain as bright as polished nickel, under all weather conditions, being topped with an expensive Monel Metal of heavy gauge.

High Visibility

The National Traffic Appliance Marker when firmly anchored raises its smooth, brilliant, dome-like head of Monel Metal above any slush or mud to give a positive signal to pedestrian and driver alike.

The National Traffic Marker is the one marker that can be installed in any kind of street, such as asphalt, concrete, wood blocks or brick pavement. Installation is very simple, and can easily be accomplished by unskilled labor.

The National Traffic Marker costs less than the upkeep of maintaining a painted line.

Guaranteed

The National Traffic Marker is sold on a guarantee of five years when installed as directed.

Write for quotations and our portfolio on traffic problems.

The Prongs SPREAD

NATIONAL TRAFFIC APPLIANCE CORP.
General Offices: 510 North Dearborn Street
Chicago, Illinois

DISTRIBUTORS

EUROPE:
G. & J. Weir, Ltd.,
Cathcart, Glasgow, Scotland

CANADA:
Economy Railway Appliance Company, Ltd.,
902 McGill Bldg., Montreal

MONEL METAL TRAFFIC MARKER

Actual Photograph of Monel Metal Markers in Granite Blocks

Member American Road Builders' Association

HANLINE BROS. **ZONE PAINT** FOR STREET MARKING

DRIES IN SIX MINUTES

FAMOUS FOR ITS WEARING QUALITIES

Write for booklet and quotation

ESTABLISHED 1848 **HANLINE BROS.** BALTIMORE, MD.

INTEREST RATES ARE NOW FAVORABLE FOR LONG-TIME FINANCING

We invite inquiries.

C. W. McNEAR & COMPANY

Established 1908

Municipal Bonds

First National Bank Bldg., Chicago — Equitable Bldg., New York

ALL STYLES OF SIGNALS

HIGH-GRADE DIFFUSING LENSES

SILVERED GLASS REFLECTORS

HIGH DEGREE OF VISIBILITY!

See the May issue of THE AMERICAN CITY, pages 599-603, for details of our Central Traffic Control Board.

HARRINGTON-SEABERG CORP.

MOLINE, ILL.

Mfrs. Traffic, Fire Alarm and Police Signal Equipment.

Information and Prices Given on Request

PHILADELPHIA

CHESTNUT and 39th STREET

Hotel Pennsylvania

Fireproof, Unrestricted Parking, Garage

600 Rooms - - 500 Baths

Rooms with running water from $2.50 per day
Rooms with private bath and shower from $3.50 per day

Food and Service the Best

Near West Philadelphia Station, Penn. Railroad
University of Pennsylvania Franklin Field

positive warning---best protection

The SURE-STOP Street Signal

"Made of Rubber—Made to Run Over"

Illustration in oval shows how SURE-STOP protects a thorofare at street intersections.

This visible and flexible rubber signal projects seven inches above the pavement surface. It is held firmly in position between a two-piece creosoted oak wedge base set in pavement as shown above. The ends of the wedge are fastened to anchor plates. Overall dimensions: 22 inches long by 9 inches high.

This signal is a regular "traffic cop" that is always on duty every day in the year, rain or shine. Stands right out in the middle of the street where it is always seen and always gives its warning "Stop" signal to every approaching motorist.

It protects thorofares at street intersections; prevents accidents, injuries and possible loss of life. The SURE-STOP street signal in use means accident insurance, because it is:

1--Flexible. Made of pure black rubber reinforced with fabric. Flexible as a rubber ball. Not damaged by traffic.

2--Visible. Black rubber inlaid with bright yellow letters 4 inches high—visible in any weather.

3--Durable. A long-life signal that wears like a cord tire.

4--Economical. Easily installed. Gives continual service without any attention. Cuts stop line expense 50 per cent. Gives maximum safety at a minimum of cost.

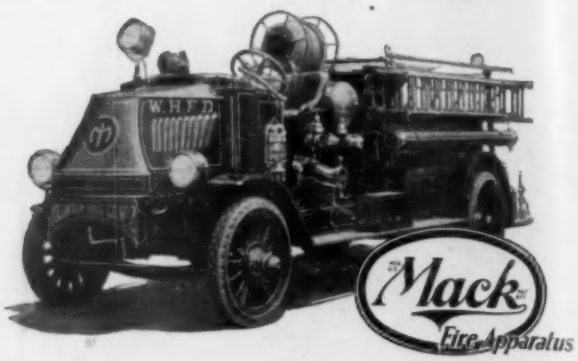
The SURE-STOP is rapidly growing in popularity. Many municipalities now use it and more of them are making it a part of their regular traffic signal systems. Endorsed by city officials and publicly accepted.

Write for samples and prices in quantity lots

The Standard Traffic Signal Co.

1711-13 East Second Street
Wichita, Kansas

Progressive Fire Engineering



WHEN communities are of such small size that they are forced to depend for fire protection upon but few pieces of apparatus, it is essential that such equipment be of the highest quality available.

West Haverstraw, New York, has secured the ideal unit for its needs in the Model AC Triple Combination Pumping engine, chemical and hose car, pictured above.

MACK fire apparatus is built under the same exacting standards that have earned dominance for MACK transport equipment.

The complete line of MACK fire apparatus includes motors of either 4 or 6 cylinders, with pump capacities ranging from 350 to 1000 gallons per minute. Send for complete descriptive literature.

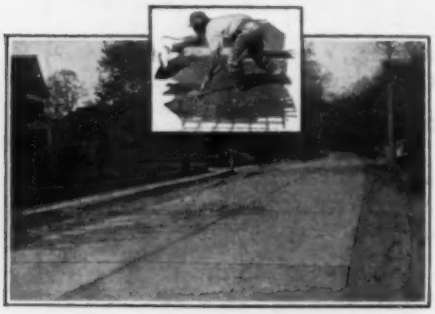
MACK TRUCKS, Inc.
INTERNATIONAL MOTOR COMPANY
25 Broadway New York City

One hundred and four direct MACK factory branches operate under the titles of: "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION", "MACK MOTOR TRUCK COMPANY", or "MACK TRUCKS OF CANADA, LTD."

American Steel & Wire Company's

WIRE FABRIC

"The Steel Backbone for Concrete"



WIRE Fabric provides *complete* distribution of strong, cold drawn steel throughout the concrete slab. This is the most effective reinforcement against cracks and slab disintegration. Let us send you the facts about Wire Fabric Reinforcement.

Sales Offices:
CHICAGO NEW YORK BOSTON CLEVELAND WORCESTER DETROIT PHILADELPHIA PITTSBURGH BUFFALO CINCINNATI KANSAS CITY BIRMINGHAM WILKES-BARRE ST. LOUIS ST. PAUL OKLAHOMA CITY BALTIMORE MEMPHIS DALLAS ATLANTA DENVER SALT LAKE CITY
EXPORT REPRESENTATIVE: U. S. STEEL PRODUCTS CO., NEW YORK
PACIFIC COAST REPRESENTATIVE: U. S. STEEL PRODUCTS CO.
SAN FRANCISCO LOS ANGELES PORTLAND SEATTLE

STANDARD

COLD PATCH ASPHALT
SOCONY BRAND

For repairing bituminous macadam roads—economically and lastingly.

• • •

Standard Asphalt Binder A *for surface treatment*
Standard Asphalt Binder B *for penetration work*
Standard Asphalt Binder C *for the mixing method*
Standard Refined Mixing Asphalt *for sheet asphalt paving*
Standard Asphalt Joint Fillers, *for brick or block pavements*
Standard Paving Flux, Standard Bridge Asphalt and Preserving Oils

Specifications and all other particulars furnished on request

SOCONY ASPHALTS AND ROAD OILS

STANDARD OIL CO. OF NEW YORK
26 Broadway

Mr. MAYOR

Are they for or against you?

Because a village, town or city is judged on account of its traffic lines and traffic regulation, many officials receive much favorable comment.

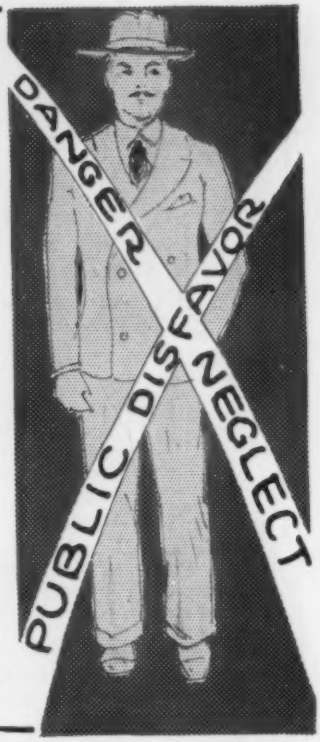
Are you neglecting this very important necessity which is saving hundreds of lives every day?

Why not send for information today that will show you the most modern up-to-date way of marking your streets?

The Continental Products Co.

Dept. D, Euclid, Ohio

Mfg.: Continental Zone Painting Machine, Municipal Paints, and Street Marking Paints.



HAZARD

TRAFFIC CONTROL CABLES

give satisfactory service in Detroit and hundreds of other cities throughout the country.

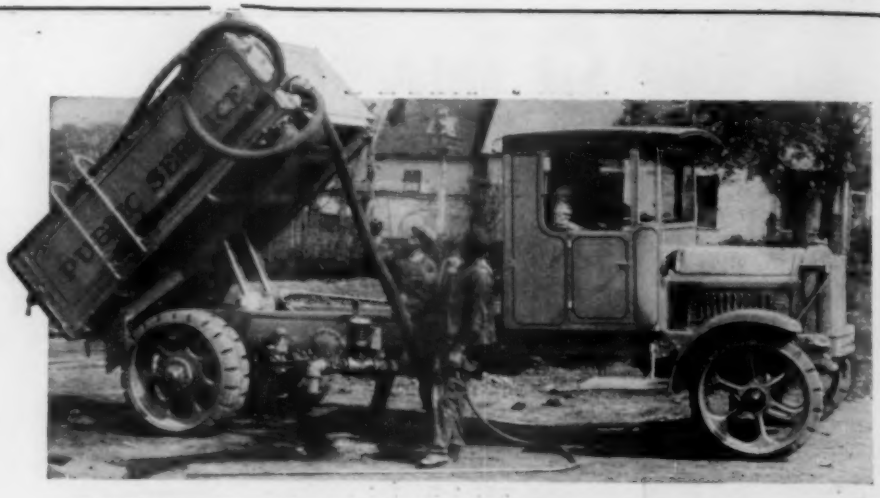
They comply in all respects with the requirements of the I.A.M.E. specifications, plus Hazard standard values.

HAZARD MFG CO

WILKES-BARRE PA

New York Pittsburgh Chicago Denver Birmingham Philadelphia

Hazard Traffic Control Cables give lasting service



HEIL Builds Municipal Equipment

Here's a Heil body and hoist, mounted on a Federal truck, equipped with an Auto Eductor for cleaning catch basins. This unit is in service at Grand Rapids, Michigan, and similar units are in service at Cleveland, Milwaukee, and many other cities. The complete line of Heil municipal equipment includes standard dump bodies with or without batch boards, sprinkler tanks for mounting on Ford and other light chasses, special garbage bodies, trailer bodies for hauling rubbish, ashes and garbage, pressure tanks, etc. Ask Heil to figure on your next requirements. There is no substitute for Heil Quality.

THE HEIL CO.

1242-60 26th Ave. Milwaukee, Wis.

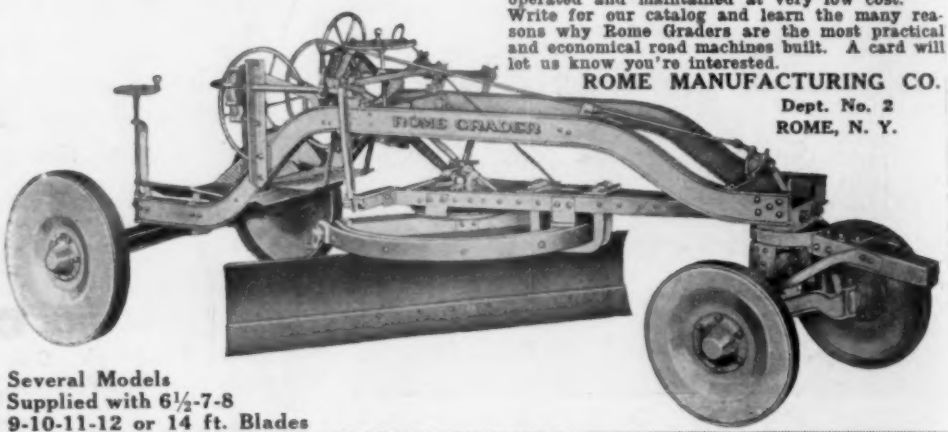
ROME Patented HIGH LIFT GRADERS

"The Best Bargain is Quality"

Pictured below is our 9 ft. Model. A Machine of Quality.

With road graders as with everything else, these words are true.
It is not the initial investment which is of primary importance, but the cost of upkeep and repairs and the valuable time lost in making them.
Rome Graders, because of their correctly balanced, hot riveted steel frames, indestructible disc wheels and simplified construction, can be operated and maintained at very low cost.
Write for our catalog and learn the many reasons why Rome Graders are the most practical and economical road machines built. A card will let us know you're interested.

ROME MANUFACTURING CO.
Dept. No. 2
ROME, N. Y.



Several Models
Supplied with 6½-7-8
9-10-11-12 or 14 ft. Blades

Design and construction by the State Engineer and Surveyor of New York; C. H. Wood, Senior Assistant Engineer, in charge of plans and specifications; E. D. Hendricks, Division Engineer, in charge of field work; J. C. Bell and R. B. Smith, Resident Engineers. Construction contractors: Du Bois, Bennett and Son, Schenectady, N. Y.; American Pipe and Construction Co., Amsterdam, N. Y.; American Construction and Dredging Co., Cleveland, Ohio; and J. W. Holler, Inc., Hudson Falls, N. Y.

"It Couldn't Be Done"— But Reinforced Concrete Made It Possible

VALUABLE realty considerations made necessary a short-radius curve in the Western Gateway Bridge over the Mohawk River near Schenectady, N.Y.

As usual, there were many who said, "It can't be done" in an arch bridge.

The State Engineers Department of New York answered by designing two skewed, curved, reinforced concrete barrel arch spans, of 96-foot openings. The center line of the roadway has a radius of 242 feet, curving through a central angle of nearly 55 degrees. Unusual problems in thrust and impact loading were involved, once again demonstrating the wide adaptability of reinforced concrete for important and unusual structures.

PORTLAND CEMENT *Association*

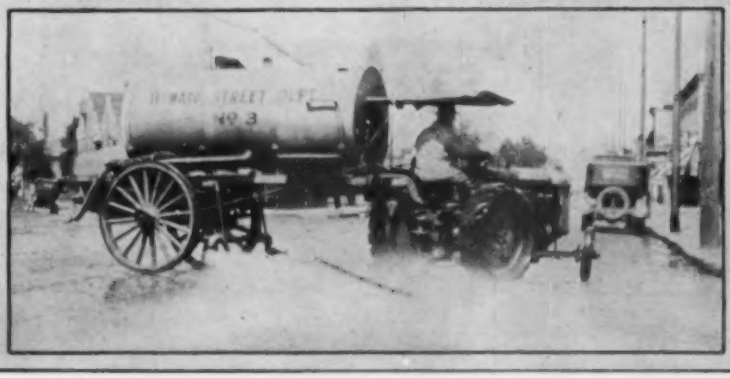
Concrete for Permanence CHICAGO

TRAIL-IT

SEMI-TRAILER-TRACTOR HITCH

Motorizes Horse-Drawn Equipment and REDUCES HAULAGE COSTS

The TRAIL-IT Hitch is used by many Trailer and Wagon manufacturers as standard equipment.



DIRT MOVERS

STREET DEPARTMENTS

HAULAGE CONTRACTORS

We can SAVE you MONEY

TRAIL-IT COMPANY

2516 Wabash Ave., St. Paul, Minn.

RUSSELL
~motor patrol No. 4

Caterpillar Two-Ton Tractor For Power

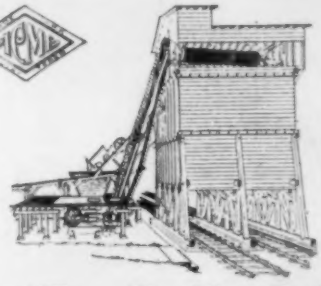
For highest efficiency and lowest work-cost, the No. 4 is an added achievement—a machine of more power and heavier construction. Does with ease the heavy maintenance work on gravel or dirt roads—particularly efficient on loose or sandy soil where wheel-type tractors balk or slip.

Russell Motor Patrols are built in four sizes—

No. 2 for Fordson tractor for power
No. 3 for 10-20 McCormick-Deering tractor for power
No. 4 for "Caterpillar" 2-ton tractor for power
No. 5 for "Cletrac" 20-K tractor for power

Each of the four models—No. 2—No. 3—No. 4—No. 5—is equipped with scarifier—worked with blade or independent of blade, as desired.

Russell Grader Mfg. Company
Factory & Gen. Offices Minneapolis, Minn.
Representatives in all principal cities



Solve Your Crushing Problem
with an Acme Plant,—Complete!

WHATEVER your problem in preparing stone or gravel for road or concrete work, there is an Acme combination of crushers, elevators, screens, bins, and accessories that will successfully overcome it.

The wisest course is to install a crushing plant complete, a plant that is Acme-designed to meet every existing problem and Acme-equipped to give you service for years to come. Write for full particulars.

Acme Road Machinery Co., Inc.
Frankfort, N. Y.

Every time a community pays for *one* brick pavement it gets *two!*

One side of the brick, properly laid, will give twenty-five to thirty-five years of service, at least. Then, even if the foundation should fail, *the other side* is ready for just as many more years of resistance to traffic.

Scores of far-sighted communities are saving taxes in this way by using vitrified brick, asphalt-filled. Write for facts and figures from official public records proving the salvage value of brick pavements.

No one who voted for Grover Cleveland on his second election for President is less than 56 years old. And yet torch-light processions of that presidential campaign (1892) marched on brick pavements which are still in use today.

Keep this in mind when your community is called upon to decide on paving materials.

Advocate

VITRIFIED Brick PAVEMENTS

OUTLAST THE BONDS

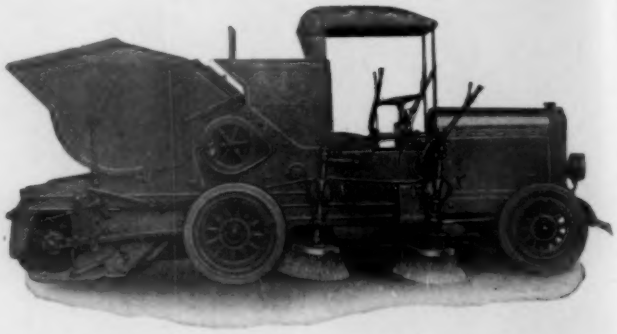
NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION, ENGINEERS BLDG., CLEVELAND, OHIO

THE

Kinney

TRADE MARK REG. U.S. PAT. OFF.

MOTOR PICK-UP STREET SWEEPER



A CLEAN SWEEP—A CLEAN STREET—A CLEAN CITY

Cleanly swept streets are a source of civic pride. They are indispensable to public health and enjoyment. The Kinney-Springfield motor pick-up sweeper covers all the most exacting requirements of up-to-date sanitary street cleaning by the method of sweeping and is the most economical and efficient method of street cleanliness.

Write for our descriptive catalog.

KINNEY MANUFACTURING COMPANY

BOSTON, MASS.

New York Chicago Philadelphia Houston San Francisco Kansas City Los Angeles

ANOTHER ENDORSEMENT

"Indianapolis is using 57 Highway Trailers on Garbage & Ash collection. We find the trailers efficient and economical and the Company prompt, reliable and trustworthy." R. T. McFall, Pres. Sanitary Board, Indianapolis, Ind.

Note that Indianapolis trailers are all equipped with roll top canvas covers.

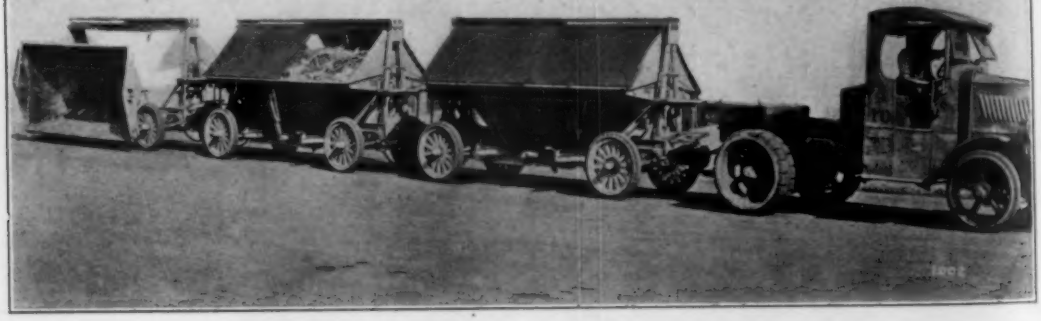
Can you visualize what an important step forward all this would mean to the present administration in your City.

Write us for literature and detailed information.

HIGHWAY TRAILER COMPANY

EDGERTON WISCONSIN, U. S. A.

The World's Largest Trailer Plant



Natural

the STANDARD Kentucky
ROCK ASPHALT

EDMONSON COUNTY

FROM Cuba to Minnesota, Natural Rock Asphalt is laid with uniform success—no shoving, rutting or cracking. Shipped in open-top cars ready to lay cold. Roller and small tools are the only equipment needed.

Natural Rock Asphalt is peculiarly adapted for resurfacing macadam, gravel, brick, asphalt, concrete and other types. Specifications sent to engineers on request. Road and street officials should write for Booklet AC-3.

Resurfaced brick at Bedford, Indiana

Natural Rock Asphalt Corporation
INCORPORATED
Owensboro, Kentucky.
Producers of Highest Quality Natural Rock Asphalt from Edmonson County, Kentucky

"HVASS" DOUBLE UNIT FLUSHER-SPRINKLER

PRODUCT OF

CHAS. HVASS & CO., INC.

BACKED BY FIFTY-FIVE YEARS' EXPERIENCE SUCCESSFULLY FILLING THE NEEDS OF MUNICIPALITIES, COUNTIES AND STATES FOR PUBLIC WORKS

MANUFACTURERS OF

Motor Truck Street Flushers	Horse Drawn Sprinklers	Heating Kettles
Motor Truck Street Sprinklers	Horse Drawn Sweepers	Push Brooms
Bituminous Distributors	Fordson Trailer Sweepers	Can Carriers and Cans
Garbage and Refuse Trailers	Air Compressor Outfits	Trailer Flushers
Heavy Duty Trailers	Refuse Wagons	Asphalt Plants

WRITE FOR DESCRIPTIVE CATALOG

Office: 508 East 19th St. **New York, N. Y.**

FABRIC FIRE HOSE COMPANY

9-15 PARK PLACE

NEW YORK, N. Y.

***FACTORY:* SANDY HOOK, CONN.**

Patentees and Sole Manufacturers since 1880

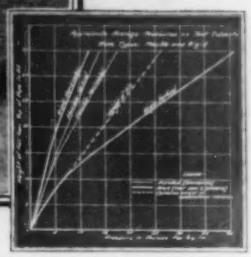
WAX AND PARA GUM TREATED COTTON
RUBBER LINED FIRE HOSE

BRANCH OFFICES:

Chicago, Ill.	Dallas, Texas	Binghamton, N. Y.
Atlanta, Ga.	Portland, Ore.	Pittsburgh, Pa.
Columbus, Ohio	San Francisco, Cal.	Bloomfield, N. J.
Minneapolis, Minn.	Baltimore, Md.	Montreal, Canada.
	Boston, Mass.	

A safe small bridge

The safety of large diameter Armco Culverts has been proved in practice. The Farina Test showed why.



at culvert cost

Armco Culverts in diameters up to 108 inches have proved they make better small bridges. Their great strength resists strains from weight of fill or load of traffic. Their flexibility assures uniform distribution of pressure. Their simplicity permits rapid and fool-proof installation.

And these better bridges give culvert economy, year-in, year-out. Their cost is no more than that of less satisfactory substitutes. It is always less than for built-in-place bridges. This economy applies to the entire life of the structure. Armco Culverts require no periodic repairs, no painting, no upkeep—no watching.

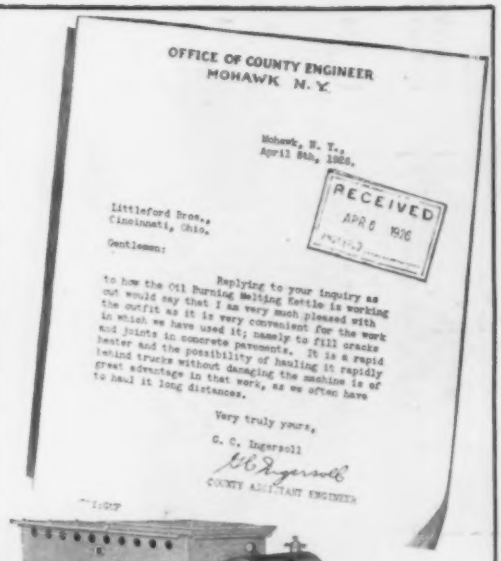
Large-diameter Armco pipe is adaptable not only to safe, small bridges, but to under-crossings for any purpose such as cattle passes and public and industrial subways. Suggestions on how to apply this economy of culvert construction to *your* bridge problems gladly given on request—no obligation.

ARMCO CULVERT MANUFACTURERS' ASSOCIATION
MIDDLETOWN . . OHIO

Forty manufacturing plants throughout the United States and Canada assure you immediate service on drainage requirements, no matter where you may be.

ARMCO CULVERTS

Predominant in use---because predominant in quality



OFFICE OF COUNTY ENGINEER
MOHAWK, N. Y.

Mohawk, N. Y.,
April 8th, 1926.

RECEIVED
APR 6 1926

Littleford Bros.,
Cincinnati, Ohio.

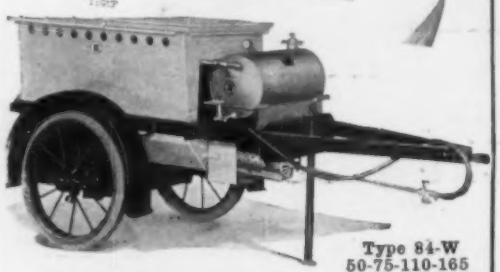
Gentlemen:

Replying to your inquiry as to how the Oil Burning Melting Kettle is working out would say that I am very much pleased with the outfit as it is very convenient for the work in which we have used it; namely to fill cracks and joints in concrete pavements. It is a rapid heater and the possibility of hauling it rapidly behind trucks without damaging the machine is of great advantage in that work, as we often have to haul it long distances.

Very truly yours,

G. C. Ingersoll

COUNTY ASSISTANT ENGINEER



Type 84-W
50-75-110-165
gallon capacities.

Universal Satisfaction!

The letter above is a sample of many from users of Type 84-W Oil-Burning Melting Kettle. New standards of heating speed, new ideas of handling convenience and economy are being created through its use. Many exclusive features incorporated in its design and construction. Extremely simple to operate to get most satisfactory results. Write today for full details and a quotation.

Manufactured by

LITTLEFORD BROS.

500 East Pearl Street **Cincinnati, Ohio**

THE SIGN OF GOOD HEATERS

LITTLEFORD TAR AND ASPHALT HEATERS

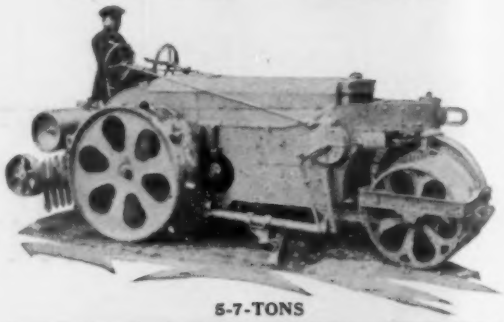
HUBER

4-CYLINDER MOTOR ROLLER

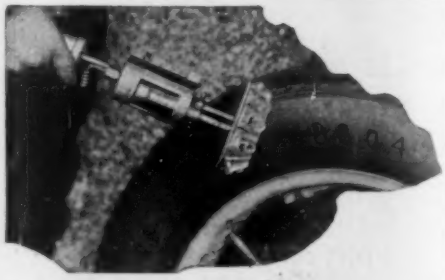
The Huber Five- and Seven-Ton Four-Cylinder Motor Rollers have all of the advantages of the Ten- and Twelve-Ton Hubers: Single lever control—no shifting of gears—clear operating view—roomy deck—short turning—quick action. Can be fitted with both power scarifier operated by compressed air and grader blade if desired. A real "inbuilt" roller—not an attachment built around a tractor.

Complete catalog free on request

THE HUBER MANUFACTURING CO.
305 Center St. **Marion, O.**



5-7-TONS



You Wouldn't Give Away Truck and Auto Tires—

But you might just as well give them away as to let them go unbranded.

Thieves walk off with them almost at will, and other people think nothing of switching tires with a city-owned car—a deal in which the city always loses.

An Everhot Tire Branding Outfit will stop these losses.

Write today for full details and prices

EVERHOT
America's Brand Makers
EVERHOT MANUFACTURING CO. MAYWOOD, ILLINOIS

Are Your Roads Well-Groomed?

Use

"HERBICIDE"

THE WEED EXTERMINATOR

Kills the Roots as well as the tops

Just as good clothes are an asset to the business man—

Well-groomed roads are an asset to the city, town or village.

Every town in the land has to contend with those persistent little pests—the weeds. Along roadways and paths, in cobbled gutters, in parkways and cemetery drives, in ground around water works, tennis courts and other public grounds —they crop up everywhere.

But there is a way to get rid of them—"HERBICIDE."

"HERBICIDE" kills the ROOTS as well as the tops, consequently one application lasts for the season. Hundreds of municipalities have found it the most effective and economical way to get rid of unsightly vegetation.

It is applied with any form of a sprinkling apparatus from an ordinary sprinkling can to a sprinkling wagon.

Shipped in concentrated form, each gallon of "HERBICIDE" makes forty to fifty gallons when diluted.

READE MANUFACTURING CO.

105 Hoboken Ave. **Jersey City, N. J.**

Reade Mfg. Co., Jersey City, N. J.

We are interested in getting rid of weeds on ..... and will be pleased to receive full information about " 'HERBICIDE' The Weed Exterminator."

Name .....

Address .....

.....

Three thousand cities

BELOW is a partial list of cities that have selected Lyle Signs after years of experience, in preference to all others. Lyle is the most durable street sign made—the *only* carved-in sign. To solve your sign problems once and for all, order one Lyle Sign now and see the difference for yourself.

Here is a partial list of LYLE SIGN users

ALABAMA
Andalusia
Birmingham
Boyles
Chapman
Dothan
Enterprise
Fairfield
Huntsville
Jackson
Jasper
Mobile
North Birmingham
Roanoke
Selma
Sylacauga
Tuscaloosa
Tuskegee
Union Springs
Uniontown
Yuma

ARKANSAS
Bentonville
Crawfordsville
Fayetteville
Jonesboro
Little Rock
Marianna
Morrilton
Parkin
Searcy
Texarkana

AUSTRALIA
Sidney

CALIFORNIA
Arcadia
Berkeley
Byron
Long Beach
Los Angeles
Manhattan Beach
Monrovia
National City
Orange
Turlock
West Berkeley
Watsonville

CANADA
Calgary Alberta
Guelph Ontario
Oshawa
Ottawa
Port Arthur
Sherbrooke Quebec

COLORADO
Cortez
Fort Collins
Fruita
Glenwood Springs
Golden
Grand Junction
Littleton
Loveland
Monte
Pagosa Springs
Rifle
Trinidad
Windsor

CONNECTICUT
Berlin
Canaan
Colchester
Hamden
Manchester
Meriden
Middletown
New Britain
New Canaan
North Greenwich
Rockville
Shelton
Westport

DELAWARE
Dover
Harrington
Middletown

FLORIDA
Bradentown
Brooksville
Clearwater
Daytona
DeLand
Fort Lauderdale
Fort Pierce
Mayo
Miami
Quincy
Safety Harbor
St. Augustine
Tampa
Tarpon Springs
West Palm Beach

GEORGIA
Albany
Americus
Atlanta
Brunswick
Buford
Columbus
Cuthbert
Douglas
Dublin
Eatonton
Elberton
Louisville
Macon
Madison
Palmetto
Preston
Rockmart
Rome
Royston
Sylvania
West Point
Valdosta

IDAHO
Boise
Caldwell
Kellogg
Lewiston
Mullen
Nampa
Payette
Rupert
St. Anthony
Shelley
Twin Falls

ILLINOIS
Alton
Armington
Aurora
Barrington
Batavia
Belvidere
Bloomington
Cairo
Carbondale
Centralia
Chicago
Chicago Heights
Clayton
DeKalb
Dixon
Spencer
Springville
Sterling
Waukon
Waterloo
Webster City
Woodbine

KANSAS
Beattie
Humboldt
Hutchinson
Independence
Junction City
Kansas City
Kinsley
Lawrence
Lobo
Liberal
Liberty
Marion
Meade
Osborne
Ottawa
Perry
Phillipsburg
Solon
Towner
Troy
Wellington
Westmoreland
Whatsoever
Whiting
Wichita

KENTUCKY
Bardstown
Berea
Crabtree
Elizabethtown
Fleming
Lexington
Louisville
Madway
Morehead
Mt. Sterling
Newport
Olive Hill
Paris
Versailles

LOUISIANA
Alexandria
Baton Rouge
Bogalusa
Crowley
Donaldsonville
Eunice
Franklin
Gretna
Houma
Jennings
Lake Charles
Lake Providence
Lake Zurich
Le Sueur
Lewiston
Maywood
Moline
Monmouth
Kaskaskia
Neponset
Newman
Naperville
North Chicago
Oak Park
Palos Park
Peoria
Princeton
Spring Bold
Sterling
Stockton
Syracuse
Tremont
Troy
Virden
Virginia
Washington
Wheaton
Wiscasset
Worth
Zion

INDIANA
Anderson
Arcadia
Arcola
Austin
Batesville
Bluffton
Carlisle
Connersville
Crawfordsville
Cynthiana
Decatur
Elkhart
Evansville
Ft. Branch
Fort Wayne
Frankfort
Greenwood
Hammond
Huntington
Indianapolis
Jasper
Liberty
Logansport
Mt. Vernon
Muncie
Napanee
New Haven
Plymouth
Princeton
Remington
Richmond
Rolling Prairie
Rushville
Silver Lake
South Bend
Wabash
Washington
Winslow

IOWA
Algona
Ames
Armstrong
Belmond
Britt
Calmar
Calumet
Cascade
Centerville
Clarion
Clear Lake
Corwith
Cushing
Davenport
Des Moines
Edgewood
Eldora
Fairfield
Forest City
Garner
Greene
Harlan
Iowa Falls
Kenyon
Keokuk
Kinsley
Kirkman
Knoxville
Lake Mills
Lemoni
Lenox
Leland
Lester
Manchester
Manly
McGregor
Miller
Mitchell
Monona
Nashua
Nevada
New Albin
New Hampton
Northwood
Onawa
Orchard
Osage
Parkersburg
Postville
Rockford
Rock Rapids
Russell
Sheldon
Shenandoah
Sidney
Sioux City
Stanwood
Tipton
Traer
Tripoli
Vinton
Waterloo
Waukon
Waverly
Webster City
Wesley
West Union
Winterset

KANSAS
Abilene
Alma
Arkansas City
Atchison
Baldwin
Belleville
Beloit
Caney
Chanute
Cherryvale
Clay Center
Coffeyville
Concordia
Cottonwood Falls
Council Grove
Dodge City
Downs
Elkhart
Ellsworth
Emporia
Eureka
Florence
Fort Scott
Garden City
Girard
Goodland
Great Bend
Hays
Herington
Hiawatha
Hoisington
Holton
Howard
Independence
Iola
Kinsley
Lawrence
Leavenworth
Lincoln
Liberal
Lyons
Manhattan
Marysville
Minneapolis
Mission
Moline
Neodesha
Newton
Norton
Oakley
Oberlin
Osawatomie
Osborne
Ottawa
Parsons
Phillipsburg
Pittsburg
Plainville
Pratt
Russell
Salina
Scott City
Sedan
Smith Center
Stockton
Sublette
Topeka
Valley Falls
Wamego
Washington
Wellington
Wichita
Winfield

KENTUCKY
Ashland
Bardstown
Bellevue
Berea
Bowling Green
Cadiz
Campbellsburg
Carrollton
Catlettsburg
Central City
Columbia
Corbin
Covington
Cynthiana
Danville
Dawson Springs
Elizabethtown
Eminence
Erlanger
Falmouth
Flemingsburg
Frankfort
Franklin
Georgetown
Glasgow
Greenville
Harlan
Hartford
Hazard
Henderson
Hickman
Hopkinsville
Irvington
Jackson
Lancaster
Lawrenceburg
Lebanon
Leitchfield
Lexington
Louisville
Madisonville
Maysville
Middlesboro
Monticello
Morehead
Mt. Sterling
Mt. Vernon
Munfordville
Murray
Nicholasville
Owensboro
Owenton
Paducah
Paris
Pikeville
Princeton
Providence
Richmond
Russellville
Scottsville
Shelbyville
Somerset
Springfield
Stanford
Versailles
Vine Grove
Warsaw
Whitesburg
Williamsburg
Winchester

LOUISIANA
Abbeville
Alexandria
Baton Rouge
Bogalusa
Crowley
Donaldsonville
Eunice
Franklin
Gretna
Houma
Jennings
Lake Charles
Lake Providence
Leesville
Minden
Monroe
Morgan City
Natchitoches
New Iberia
New Orleans
Opelousas
Plaquemine
Ruston
Shreveport
Springhill
Thibodaux
Vidalia
Winnfield

MAINE
Auburn
Augusta
Bangor
Bath
Belfast
Biddeford
Boothbay Harbor
Brewer
Brunswick
Calais
Camden
Dover
Ellsworth
Farmington
Fort Fairfield
Gardiner
Hallowell
Houlton
Kennebunk
Kennebunkport
Lewiston
Lincoln
Machias
Madawaska
Millinocket
Old Orchard
Orono
Portland
Rockland
Rumford
Saco
Sanford
Skowhegan
Thomaston
Waterville
Wells
Westbrook
Winslow
Winthrop
York

MARYLAND
Annapolis
Baltimore
Bel Air
Cambridge
Chestertown
Cumberland
Easton
Elkton
Frederick
Hagerstown
Havre de Grace
Laurel
Oakland
Rockville
Salisbury
Westminster

MASSACHUSETTS
Adams
Amesbury
Arlington
Attleboro
Barnstable
Belmont
Boston
Braintree
Brockton
Brookline
Cambridge
Canton
Chelsea
Chicopee
Clinton
Concord
Dedham
Dorchester
Duxbury
Everett
Fall River
Falmouth
Fitchburg
Framingham
Gardner
Gloucester
Greenfield
Hanover
Haverhill
Holbrook
Holliston
Hudson
Hyannis
Ipswich
Lawrence
Leominster
Lexington
Lowell
Lynn
Malden
Marblehead
Marlboro
Medford
Melrose
Methuen
Middleboro
Milford
Milton
Natick
Needham
Newburyport
Newton
Northampton
Norwood
Peabody
Pittsfield
Plymouth
Quincy
Randolph
Reading
Revere
Rockland
Salem
Saugus
Scituate
Somerville
Springfield
Stoneham
Stoughton
Taunton
Wakefield
Waltham
Watertown
Webster
Wellesley
Westfield
Weymouth
Winchester
Winthrop
Woburn
Worcester

MICHIGAN
Adrian
Albion
Allegan
Alma
Alpena
Ann Arbor
Bad Axe
Battle Creek
Bay City
Benton Harbor
Big Rapids
Birmingham
Cadillac
Caro
Charlevoix
Cheboygan
Coldwater
Coldwater
Dearborn
Detroit
Eaton Rapids
Escanaba
Flint
Fremont
Gaylord
Grand Haven
Grand Rapids
Grayling
Hancock
Hillsdale
Holland
Houghton
Howell
Ionia
Iron Mountain
Ironwood
Ishpeming
Jackson
Kalamazoo
Lansing
Lapeer
Ludington
Manistee
Manistique
Marquette
Marshall
Menominee
Midland
Monroe
Mt. Clemens
Mt. Pleasant
Muskegon
Niles
Northville
Norway
Owosso
Petoskey
Plymouth
Pontiac
Port Huron
Rochester
Saginaw
St. Clair
St. Ignace
St. Johns
St. Joseph
Sandusky
Sault Ste. Marie
Sebewaing
South Haven
Sturgis
Three Rivers
Traverse City
Wakefield
Wayne
Wyandotte
Ypsilanti

MINNESOTA
Albany
Albert Lea
Annandale
Anoka
Aurora
Barnesville
Battle Lake
Benedict
Bemidji
Big Falls
Brandon
Breckenridge
Brewster
Buffalo
Caledonia
Chisholm
Cokato
Crookston
Crystal Bay
Dalton
Deerwood
Detroit
Duluth
Eagle Creek
Elk River
Ely
Fairmont
Faribault
Farmington
Fergus Falls
Fosston
Glencoe
Glenwood
Gonvick
Grand Meadow
Grand Rapids
Grey Eagle
Hallock
Hastings
Hibbing
Hutchinson
Jackson
Kasson
Kenyon
Lake City
Lanesboro
Le Center
Le Sueur
Litchfield
Little Falls
Long Prairie
Luverne
Madelia
Madison
Mahnomen
Mankato
Marshall
Minneapolis
Montevideo
Montgomery
Moorhead
Morris
Mountain Lake
New London
New Ulm
Northfield
Olivia
Owatonna
Park Rapids
Pelican Rapids
Pine City
Pipestone
Preston
Princeton
Red Lake Falls
Redwood Falls
Rochester
Rushford
Sauk Centre
Shakopee
Slayton
Spring Valley
St. Cloud
St. James
St. Paul
Stillwater
Thief River Falls
Tracy
Truman
Tyler
Virginia
Wabasha
Wadena
Waseca
Wells
Willmar
Windom
Winona
Worthington

MISSISSIPPI
Aberdeen
Amory
Batesville
Bay St. Louis
Biloxi
Brookhaven
Canton
Carthage
Clarksdale
Cleveland
Columbia
Columbus
Corinth
Crystal Springs
Durant
Ellisville
Forest
Gloster
Greenville
Greenwood
Grenada
Gulfport
Hattiesburg
Hazlehurst
Holly Springs
Houston
Indianola
Inverness
Jackson
Kosciusko
Laurel
Leakesville
Lexington
Louisville
Macon
Magnolia
Meridian
Monticello
Moorhead
Natchez
New Albany
Newton
Okolona
Oxford
Pascagoula
Pass Christian
Pearl River
Pontotoc
Port Gibson
Prentiss
Quitman
Raleigh
Richton
Ripley
Rolling Fork
Ruleville
Senatobia
Shelby
Starkville
Summit
Sumrall
Tupelo
Vicksburg
Water Valley
Waynesboro
West Point
Winona
Woodville
Yazoo City

MISSOURI
Aurora
Bethany
Bolivar
Boonville
Bowling Green
Brookfield
Cameron
Canton
Carrollton
Carthage
Cassville
Chillicothe
Clinton
Columbia
Cuba
Dexter
Doniphan
Edina
Excelsior Springs
Farmington
Fayette
Fulton
Gallatin
Hannibal
Harrisonville
Higginsville
Hillsboro
Houston
Independence
Jefferson City
Kahoka
Kansas City
Kennett
Kirksville
Lamar
Lancaster
Lebanon
Lexington
Liberty
Linneus
Louisiana
Macon
Malden
Marceline
Marshall
Maryville
Memphis
Mexico
Monroe City
Moberly
Neosho
Nevada
New Madrid
Oregon
Osceola
Ozark
Palmyra
Paris
Perryville
Piedmont
Platte City
Poplar Bluff
Portageville
Princeton
Rich Hill
Richmond
Rolla
Salem
Savannah
Sedalia
Shelbina
Shelbyville
Sikeston
Smithville
Springfield
St. Joseph
St. Louis
Tarkio
Troy
Union
Versailles
Warrensburg
Washington
Waynesville
Webb City
Weston
West Plains
Willow Springs

MONTANA
Anaconda
Billings
Chester
Culbertson
Deer Lodge
Kalispell
Malta
Medicine Lake
Melstone
Miles City
Great Falls
Harlem
Missoula
Poplar
Sanders
Scobey
Thompson Falls
Wibaux

NEBRASKA
Ashton
Blue Hill
Bridgeport
Carroll
Fairbury
Friend
Gering
Gordon
Gothenburg
Kimball
Lyons
Meadow Grove
Merriman
Nebraska City
Newman Grove
Niobrara
Norfolk
Oakland
Ogallala
Omaha
Ord
Pawnee City
Red Cloud
Scottsbluff
Seward
Sidney
Stanton
Superior
Tecumseh
Valentine
Wahoo
Wayne
Weeping Water
Wisner
York

NEVADA
Ely
Fallon
Lovelock
Reno
Tonopah
Winnemucca

NEW HAMPSHIRE
Berlin
Claremont
Concord
Dover
Exeter
Franklin
Hanover
Keene
Laconia
Lebanon
Manchester
Nashua
Portsmouth
Rochester
Somersworth
Wolfeboro

NEW JERSEY
Asbury Park
Atlantic City
Bayonne
Belvidere
Bloomfield
Boonton
Bordentown
Bound Brook
Bridgeton
Burlington
Caldwell
Camden
Cape May
Carteret
Clifton
Cranford
Dover
East Orange
Elizabeth
Englewood
Flemington
Freehold
Glassboro
Hackensack
Haddonfield
Hammonton
Harrison
Hoboken
Jersey City
Kearny
Keyport
Lakewood
Lambertville
Long Branch
Madison
Manasquan
Matawan
Merchantville
Millville
Montclair
Morristown
Mount Holly
Newark
New Brunswick
New Milford
Nutley
Orange
Passaic
Paterson
Perth Amboy
Phillipsburg
Plainfield
Point Pleasant
Princeton
Rahway
Ridgewood
Riverton
Roselle
Rutherford
Salem
Somerville
South Amboy
South Orange
Summit
Trenton
Vineland
Weehawken
West Orange
Westfield
Woodbury

NEW MEXICO
Albuquerque
Artesia
Carlsbad
Clayton
Clovis
Deming
Las Cruces
Las Vegas
Portales
Raton
Roswell
Santa Fe
Silver City
Socorro
Tucumcari

NEW YORK
Albany
Amsterdam
Auburn
Batavia
Bath
Binghamton
Brewster
Buffalo
Canandaigua
Canton
Cazenovia
Cohoes
Corning
Cortland
Dansville
Dobbs Ferry
Dundee
East Aurora
Elmira
Fairford
Endicott
Fonda
Floral Park
Fulton
Glens Falls
Gloversville
Goshen
Hamburg
Harriman
Haverstraw
Herkimer
Hornell
Hudson Falls
Ithaca
Jamestown
Kingston
Lakewood
Larchmont
Liberty
Lindenhurst
Little Falls
Lockport
Lowville
Mamaroneck
Manchester
Massena
Mt. Kisco
Mt. Vernon
New Hartford
New Rochelle
New York
Niagara
North Tonawanda
Norwich
Nyack
Ogdensburg
Olean
Oneida
Oneonta
Orchard Park
Ossining
Owego
Palmyra
Patchogue
Peekskill
Penn Yan
Perry
Pleasantville
Port Chester
Port Jervis
Potsdam
Poughkeepsie
Rensselaer
Rhinebeck
Rochester
Rome
Sandy Creek
Saranac Lake
Saratoga Springs
Schenectady
Scottsville
Seneca Falls
Sherburne
Sherman
Silver Creek
Sodus
Solvay
Southampton
Spencer
Stamford
Suffern
Syracuse
Tarrytown
Ticonderoga
Tonawanda
Troy
Tuckahoe
Utica
Walden
Walton
Warsaw
Waterford
Watertown
Watkins
Waverly
Webster
Wellsville
West Seneca
Westfield
White Plains
Whitesboro
Williamsville
Wolcott
Yonkers

NORTH CAROLINA
Albemarle
Asheville
Bessemer City
Burlington
Charlotte
Concord
Dallas
Durham
Elizabeth City
Fayetteville
Gastonia
Goldsboro
Greensboro
Hamlet
Henderson
Hendersonville
Hickory
High Point
Kinston
Lenoir
Lexington
Lincolnton
Marion
Monroe
Mooresville
Morganton
Mount Airy
Newton
Raleigh
Reidsville
Rockingham
Rocky Mount
Salisbury
Shelby
Statesville
Tarboro
Thomasville
Wadesboro
Washington
Waynesville
Weldon
Wilkesboro
Wilmington
Wilson
Winston-Salem

NORTH DAKOTA
Bismarck
Cando
Carrington
Casselton
Devils Lake
Dickinson
Ellendale
Fargo
Grafton
Grand Forks
Hankinson
Hillsboro
Jamestown
Kenmare
Larimore
Lisbon
Mandan
Minot
Oakes
Rugby
Valley City
Wahpeton
Williston
Woodworth
Wyndmere

OHIO
Ashland
Ashtabula
Bellevue
Butler
Bucyrus
Chardon
Cincinnati
Cleveland
Dayton
Delaware
Elizabethtown
Findlay
Garrettsville
Girard
Glendale
Hamilton
Ironton
Jacksonville
Kent
Lisbon
Lima
Loveland
McComb
McDonald
Montgomery
Norwalk
Norwood
Orrville
Painesville
Plainville
Reading
St. Marys
Shelby
Sidney
Springfield
Tiffin
Toledo
Troy
Twinsburg
Uhrichsville
Underwood
Warwick
Wellston
Williston
Woodworth
Windsor

OKLAHOMA
Ada
Alva
Anadarko
Ardmore
Bartlesville
Blackwell
Chickasha
Cushing
Duncan
Durant
Elk City
Enid
Guthrie
Guymon
Hobart
Holdenville
Hugo
Idabel
Kingfisher
Lawton
Madill
Marlow
Miami
Muskogee
Norman
Oklahoma City
Okmulgee
Pauls Valley
Pawhuska
Perry
Ponca City
Poteau
Sapulpa
Shawnee
Stillwater
Tahlequah
Tonkawa
Tulsa
Vinita
Wagoner
Watonga
Waurika
Weatherford
Wewoka
Wilburton
Woodward

OREGON
Albany
Ashland
Astoria
Baker
Bandon
Coquille
Corvallis
Eugene
Grants Pass
Hood River
Klamath Falls
La Grande
Lakeview
McMinnville
Medford
Newport
Pendleton
Portland
Prineville
Reedsport
Roseburg
Salem
The Dalles

PENNSYLVANIA
Allentown
Altoona
Ambler
Bangor
Beaver
Bedford
Bellefonte
Berwick
Bethlehem
Bloomsburg
Bradford
Brookville
Butler
Carlisle
Chambersburg
Clearfield
Clifton Heights
Coatesville
Columbia
Conshohocken
Corry
Danville
Dubois
Easton
Ebensburg
Edwardsville
Elizabethtown
Emporium
Erie
Franklin
Gettysburg
Greensburg
Hanover
Harrisburg
Hazleton
Honesdale
Huntingdon
Indiana
Jeannette
Jersey Shore
Johnstown
Kane
Kingston
Kittanning
Lancaster
Lansdale
Lebanon
Lewistown
Lock Haven
Mahanoy City
Manheim
Mauch Chunk
McKeesport
Meadville
Mechanicsburg
Media
Middletown
Milton
Monessen
Montrose
Mount Carmel
Mount Holly Springs
Nanticoke
Nazareth
New Castle
New Cumberland
New Kensington
Norristown
Oil City
Oxford
Palmerton
Parkesburg
Pen Argyl
Perkasie
Philadelphia
Phoenixville
Pittsburgh
Pittston
Plymouth
Port Allegany
Pottstown
Pottsville
Quakertown
Reading
Renovo
Ridgway
Royersford
Saint Marys
Schuylkill Haven
Scranton
Selinsgrove
Shamokin
Sharon
Shenandoah
Shippensburg
Slatington
Somerset
Souderton
Spring City
State College
Stroudsburg
Sunbury
Swarthmore
Tamaqua
Titusville
Towanda
Tunkhannock
Tyrone
Uniontown
Warren
Washington
Waynesboro
Wellsboro
West Chester
Wilkes-Barre
Williamsport
Wilmerding
Windber
Womelsdorf
Wyoming
Yeadon
York

RHODE ISLAND
Bristol
Central Falls
Cranston
East Greenwich
Newport
Pawtucket
Providence
Warren
Warwick
Westerly
Woonsocket

SOUTH CAROLINA
Abbeville
Aiken
Anderson
Bamberg
Barnwell
Beaufort
Bennettsville
Camden
Cheraw
Chester
Clinton
Columbia
Conway
Darlington
Dillon
Easley
Florence
Gaffney
Georgetown
Greenville
Greenwood
Hartsville
Kingstree
Lancaster
Laurens
Marion
Mullins
Newberry
Orangeburg
Pickens
Rock Hill
Seneca
Spartanburg
Sumter
Union
Walterboro
Williamston
Winnsboro

SOUTH DAKOTA
Aberdeen
Alcester
Armour
Belle Fourche
Beresford
Bonesteel
Brookings
Canton
Chamberlain
Clear Lake
Custer
Dell Rapids
Deadwood
Elk Point
Eureka
Faith
Flandreau
Gettysburg
Hot Springs
Howard
Huron
Irene
Lead
Lemmon
Madison
Mobridge
Mitchell
Montrose
Mound City
Northville
Oldham
Parker
Philip
Pierre
Plankinton
Rapid City
Rutland
Selby
Sioux Falls
Spencer
Sturgis
Watertown
Webster
Wilmot
Winner
White River

TENNESSEE
Clarksville
Crossville
Dayton
Huntingdon
Johnson City
Morristown
Murfreesboro
Nashville
Paris
Trenton
Tullahoma

TEXAS
Amarillo
Beaumont
Dalhart
Dexter
Eagle Pass
El Paso
Gonzales
Hillsboro
Houston
Galveston
Jacksboro
Jacksonville
Laffin
McKinney
Midland
Mineral Wells
Weatherford
Weimar
Wortham
Yoakum

UTAH
Dragon
Logan
Ogden
Salt Lake City

VERMONT
Bradon
East Burke
Hardwick
Londonville
Middlebury
Richmond
Rutland
St. Albans
St. Johnsbury
Vergennes
Waterbury

VIRGINIA
Appomattox
Abingdon
Alexandria
Bedford
Belle Haven
Cape Charles
Chase City
Chatham
Dublin
Farmville
Franklin
Fredericksburg
Galax
Graham
Hampton
Harrisonburg
Lawrenceville
Lynchburg
Manassas
Norfolk
Newport News
Norton
Orange
Parksley
Petersburg
Pulaski
Richmond
Roanoke
Rocky Mount
South Hill
Staunton
Salem
Suffolk
Suthrie
Wytheville

WASHINGTON
Aberdeen
Bellingham
Centralia
Chehalis
Colfax
Ellensburg
Everett
Hoquiam
Kelso
Longview
Montesano
North Yakima
Olympia
Port Angeles
Port Townsend
Pullman
Raymond
Seattle
Shelton
Snohomish
South Bend
Spokane
Sumner
Tacoma
Vancouver
Walla Walla
Wenatchee
Whatcom
Yakima

WEST VIRGINIA
Beckley
Bluefield
Brownsville
Charlestown
Clarksburg
Crichton
Elkins
Fairmont
Gauley
Huntington
Keystone
Kingwood
Logan
Madison
Montgomery
Morgantown
Parkersburg
Paw Paw
Philippi
Richwood
St. Albans
St. Marys
Salem
Shinnston
Sistersville
South Parkersburg
Welch
Weston

WISCONSIN
Adell
Antigo
Appleton
Ashland
Barneveld
Baraboo
Beaver Dam
Benton
Bloomer
Boscobel
Brookwood
Burlington
Cable
Columbus
Cumberland
Darlington
Dorchester
Durand
Eau Claire
Elroy
Evansville
Fond du Lac
Glen Haven
Grand Rapids
Green Bay
Hartford
Hudson
Jefferson
Kenosha
Kiel
Kilbourn
Lake Geneva
Loomis
Lodi
Madison
Manitowoc
Medford
Menasha
Menominee
Milwaukee
Milltown
Montello
Neenah
Nekoosa
New Holstein
New London
New Richmond
North Crandon
Oakfield
Oconomowoc
Oconto
Park Falls
Parrish
Philips
Port Edwards
Princeton
Prinsel
River Falls
Sheboygan
Sawyer
Shullsburg
South Milwaukee
Two Rivers
Sparta
Spooner
Stanley
Stevens Point
Sturgeon Bay
Superior
Tigerton
Tomah
Two Rivers
Waterloo
Watertown
Waupaca
Waupun
Webster
West Bend
Weston
Wilson
Wisconsin Rapids
Wilton
Wheatland
Turtleo

WYOMING
Basin
Douglas
Newcastle
Thermopolis
Rawlins

Why You will Ultimately Use LYLE SIGNS

1 APPEARANCE—Lyle Signs are acknowledged the finest looking street signs made.

2 READABILITY—Lyle Signs are carved in metal. The letters can't become indistinct—they are cut in.

3 DURABILITY—Lyle Signs are made of heavy, galvanized Armco Ingot Iron—the purest and longest lasting iron made. They are cut out of heavy sheets, far heavier than can be used for pressed metal signs. They can be instantly restored to their original brilliance.

4 FINISH—The rich and striking appearance of Lyle Signs comes from the high quality of finishing materials used. Either baked colors or genuine Dupont Duco can be furnished.

5 ECONOMY—Lyle Signs quickly prove their economy—they give you more service for your Sign Dollar.

are using

All you need do is fill out the handy order blank below. No complicated figuring for you to do. Tear it out and send it to us today. WE GUARANTEE SATISFACTION.

Give Lyle a trial—order a Lyle Sign with this order blank and see the difference

—judge their quality for yourself

Send the TRIAL ORDER BLANK today

TRIAL ORDER *for* LYLE SIGNS

LYLE SIGNS, Minneapolis, Minn.

In order that we may personally test the quality and appearance of Lyle Signs, send at once the signs checked below:

STREET INTERSECTION SIGNS

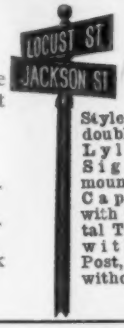
Send One Sign—Style 180B—as below:

..... Name of Street (print clearly)

..... Name of Intersection Street

Check Color of Background: ..... Black ..... Brewster Green.

(Letters are aluminum finish)



Style 180B—2 double faced Lyle Street Sign Plates, mounted on Cap Bracket with Ornamental Top; Price with 10 ft. Post, $10.85; without Post, $7.85

WELCOME SIGNS

Send .....Welcome Signs with wording (State quantity)

"WELCOME TO .....

Reverse side oval to carry wording "Thank You—Come Again"

Green background with aluminum letters.

Style 190—Size 22 x 32 in. Price—complete, including Lyle Post. Ring Brackets and Ornamental Ball Top.....$22.50

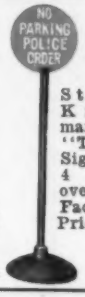
Style 121—Large Lyle Oval 22 x 32 in. finished in 3 colors. Price—complete, with Post, Lyle Ring Brackets and Ornamental Ball Top... $10.85

STANDARD SIGNS

(Note: The 2 signs illustrated here are selected as the most popular of the dozens of Lyle designs.)

Send ..... (State quantity) School Signs as illustrated

Send ..... (State quantity) No. 127 Parking Signs



Style 127—Known to many cities as "The Official Sign"—height 4 ft. 3 in. overall. Double Faced Plates. Price complete $7.85

Prices F. O. B. Minneapolis

Ordered by .....Official Position.....

Ship to .....

Ship by Freight ☐ Express ☐ Parcel Post ☐ Prepaid ☐ Collect ☐

NO WATER Gets Between These Slabs

A Sealtight-Protected Road

Installing Sealtight

SEALTIGHT

THE PERFECTED JOINT

prevents the entrance of water, sand, pebbles, or other foreign matter into the expansion gaps between two slabs of concrete.

Sealtight adheres to the sides of the slabs, sealing the joint perfectly. And Sealtight stays *in* the joint—does not run out at the top where traffic will carry it away.

Sealtight is made of a mixture of high grade pure blown petroleum asphalt, specially blended for this product, and a long flexible vegetable fibre filler. With this unusually tough fibre Sealtight is reinforced throughout and requires no reinforced sides.

W. R. MEADOWS, INC.

Make the Road Right---Use "Sealtight"

ELGIN **ILLINOIS**

Yes—we should like you to mention THE AMERICAN CITY.

PROTECT YOUR PEOPLE

from Midsummer's Dust with HUNTSVILLE HICKORY BROOMS

Disease and discomfort lie dormant on every street during the bright, warm days of midsummer until the breezes catch up any neglected dust and drive it into open doors and windows.

Street sanitation has become almost as important in the public mind as pure water and adequate sewage.

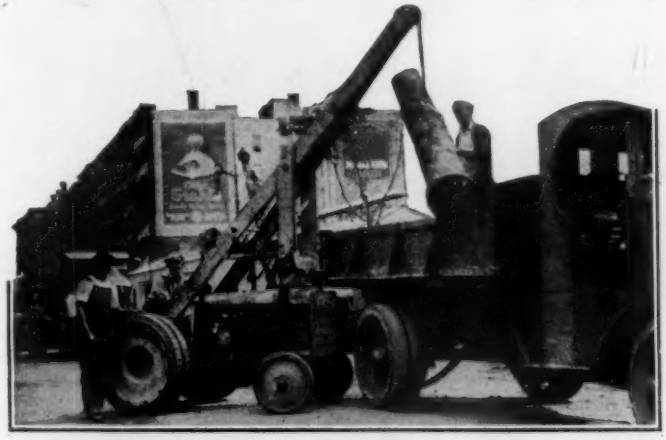
In this work "Huntsville Hickory" has been the pioneer product and remains today the standard for all types of mechanical sweepers.

FAULTLESS FIBER
HUNTSVILLE
HICKORY
FOR STREET SWEEPERS

Be sure and specify "Huntsville Hickory" when ordering of your sweeper manufacturer or jobber. Order direct from us if you prefer.

HUNTSVILLE FIBER and VENEER WORKS
FRANK H. FORD, President
HUNTSVILLE ALABAMA

Free sample will be mailed to you on request



A USEFUL PIECE OF EQUIPMENT

You probably have your share of those odd lifting and handling jobs that are such a severe tax on the strength and patience of your men.

A W&K One-Ton Fordson Crane is a good solution.

Made in two sizes with 7- and 12-foot lift. Write for illustrated booklet.

Whitehead & Kales Co
Detroit Mich

W&K

NEW

VIBRATIONLESS ~ two cylinder power

The new two cylinder Novo Rollr Engines mounted with 4 Timken Roller Bearings are free from vibration—with a choice of four reversible speeds at either end through an integral take-off—for the smoothest, most adaptable 6, 9 and 12 horsepower engines ever built.

NOVO ENGINE COMPANY, 204 Porter Street, LANSING, MICHIGAN

NOVO — THE NEW Novo ROLLR ENGINES

Clarence E. Bement, Vice-Pres. & Gen. Mgr.

CURB BARS

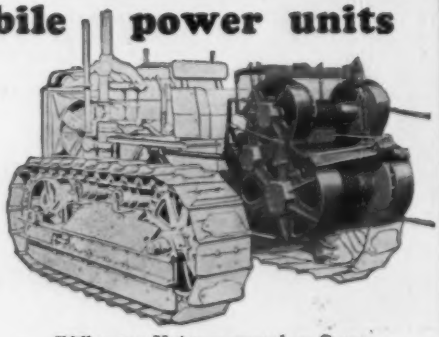
Curb edge protection is vital. Concrete alone will not stand up under the constant shock from wheels. Truscon Curb Bars, easily placed, give a permanent, wear-resistant edge to concrete curbs and keep them straight and sightly.

TRUSCON STEEL COMPANY
YOUNGSTOWN, OHIO

Warehouses and Offices in All Principal Cities

TRUSCON

Efficient
mobile power units



Willamette Hoists mounted on Caterpillar "60" and "30" tractors are always ready to go anywhere regardless of ground conditions. Put these big powerful, speedy automotive hoists to work for you. Write for information.

WILLAMETTE IRON & STEEL WORKS, PORTLAND, ORE., U.S.A.

Dealers Everywhere

Willamette
automotive hoists

ALLISON FOR THE FORDSON ~ WILLAMETTE FOR THE CATERPILLAR

Northern
BUILT BETTER Portable CONVEYORS

24-16-12 Inch,—BELT CONVEYORS
any length up to 100 feet
mounted on truck or furnished for suspension
Builders of the NORTHERN STAR CEMENT BAG CLEANER AND PORTABLE STEEL HOPPERS.
Send for Bulletins.

Northern Conveyor & Mfg. Co.
Janesville Wisconsin

The newest, most luxuriously furnished and conveniently situated hotel in the metropolis. The town home of many distinguished authors, producers and stars of the stage & screen

The BELVEDERE
New York

48th STREET WEST of BROADWAY, (Near Times Square)
Large room, private bath for one - Four Dollars - for Two Five Dollars (serving pantry optional) - - - Restaurant
CURTIS A. HALE, Managing Director BOOKLET FREE

Yes—we should like you to mention THE AMERICAN CITY.

Jackson St., Hampton, Va. (State Route No. 39). Original construction of cement concrete was disintegrating under traffic. A Kyrock wearing surface saves the old concrete and converts the old, crumbling surface into a resilient, non-skid, long-life pavement. The inset shows condition of old concrete before surfacing with Kyrock

A "Kyrock" Top saves concrete roads

Kyrock is laid *cold*. It is non-reflecting, NON-SKID and resilient. Used as a wearing surface over concrete, it reduces vibration 75 per cent. Improves the travel and prevents the slab from shattering under traffic.

Old concrete pavements which have reached a state of disintegration necessitating costly patching or complete replacement may be surfaced with Kyrock and made into permanent ways. The Kyrock top protects the old base and prevents further disintegration. Surfacing with Kyrock may be done on half the road at a time without inconvenience to traffic or construction. Write today for Kyrock data.

KENTUCKY ROCK ASPHALT CO. *Incorporated*, LOUISVILLE, KY.

Kyrock

The Perfect Pavement

KENTUCKY ROCK Kyrock ASPHALT

SPECIAL
GUTTER BROOMS
WITH FLARED ENDS

Any Size—Any Material

Bass-Cased Bamboo—All Bass—All Bamboo or All Rattan. Made from the Best Material that Can be Secured.

BLUE RIDGE MOUNTAIN HICKORY FIBRE
CLEAN-WHITE AND TOUGH
Winter-Cut from Young Trees

Street Sweeper Rolls Refilled
Any Material; Quick Service

GUTTER-WIRE
OIL TEMPERED

Guarantee Money Back if Not Satisfied.

51 YEARS' SERVICE

THE JOSEPH LAY CO.
PORTLAND, IND.

WILFORD

One-Man Control from a Single Seat

In such jobs as this—digging a basement for a church in Freeport, Long Island—the high mobility of the Wilford is cutting costs. The shallow excavation means frequent moving of the shovel. The operator needs only to swing his seat around and at his finger tips are the moving controls. Add to this the economy of dependable Fordson Power, powerful crowd, high lift and reach, speedy operation, universal distribution and service, and you know why contractors large and small are turning to this time-tested shovel for lower costs. May we send you illustrated literature and specifications?

One-man operation from a single, pivoted seat is but one reason for Wilford's surprising economies.

Universal Power Shovel Co.
WILLIAM FORD, President
Detroit

CALUMET Avenue, Calumet, Michigan, a part of Michigan State Highway No. 15, was paved in 1920 with asphalt macadam. The asphalt used in the construction was

Stanolind Paving Asphalt

There has been no maintenance on this pavement since it was laid. The above photograph shows that seven years of heavy use have not damaged it in the least.

For long service and low maintenance cost, use Stanolind Paving Asphalt.

STANDARD OIL COMPANY

(INDIANA)

General Offices: 910 S. Michigan Ave. CHICAGO, ILLINOIS

ILLINOIS	INDIANA	IOWA	S. DAKOTA	N. DAKOTA	Milwaukee	MISSOURI
Chicago	Evansville	Davenport	Huron	Fargo	Green Bay	Kansas City
Decatur	Indianapolis	Des Moines	MICHIGAN	Minot	MINNESOTA	St. Joseph
Joliet	South Bend	Mason City	Detroit	WISCONSIN	Duluth	St. Louis
Peoria	KANSAS	Sioux City	Grand Rapids	La Crosse	Mankato	
Quincy	Wichita		Saginaw		Minneapolis	

REGULATION PARK BENCH

Fig. 384

CAST IRON LEGS MORE DURABLE THAN STEEL—WOOD SLATS

Write for Quantity Prices

A. L. SWETT IRON WORKS

154 Glenwood Ave. Medina, N. Y.

Come Now to the Nassau

at Long Beach L.I.

Just 40 minutes from New York by train

THE BOARDWALK IS GLORIOUS
THE AIR IS LADEN WITH HEALTH
THE HOTEL IS A PLEASANT TREAT

Sea Baths ♪ Music ♪ Dancing
Festive Week-Ends

Room Plus Food ~ Only $8 per Day

OPEN ALL YEAR

TELEPHONE - LONG BEACH 1000

Henry H. Gerard ~ *Managing Director*

The Newark Concrete Pipe Co.

Announces

That after exhaustive and expensive experiment and study they are now prepared to offer

Reinforced Concrete Pipe

for any large water works project.

NEWARK CONCRETE PIPE CO.

462 *Broad Street, NEWARK, N. J.*

The price of maintaining dustless roads!

Last year the beautiful Kent County, Mich., roads were maintained in perfect condition at an average cost per vehicle mile of only one-fifth of one cent by the use of Solvay Flake Calcium Chloride. That's real economy!

The use of Solvay Flake Calcium Chloride positively reduces the cost of maintenance. The saving of gravel alone often pays for the Calcium Chloride.

SOLVAY
CALCIUM CHLORIDE

Solvay Flake Calcium Chloride is spread over the road surface—it then absorbs and retains moisture from the air. This action is automatic and continuous, therefore the Solvay-treated road surface stays slightly moist, smooth and DUSTLESS.

Solvay is also a true surface binder. It penetrates the road surface for several inches, holding gravel and other road material compact and firm. It does not form a surface crust to become pitted and full of holes.

Solvay Flake Calcium Chloride is applied quickly and economically as no expensive equipment is needed, and ordinary labor does the work.

Solvay is sold in 100-lb. bags and 375-lb. drums from 75 conveniently located distributing centers, assuring prompt delivery and minimum transportation charges.

SOLVAY SALES CORPORATION

40 Rector Street **New York City**

Enjoy the advantages of Solvay on your roads this year—send in the coupon AT ONCE!

mail to-day

Fill in, Cut-off and Mail today!

SOLVAY SALES CORPORATION
40 Rector St. New York

Gentlemen: Kindly send booklet No. 1064, mention number and shipping point and quotation. I am under no obligation in requesting this information.

Name.....

Address.....

City.....

State.....

CITY SAVES $50 A DAY

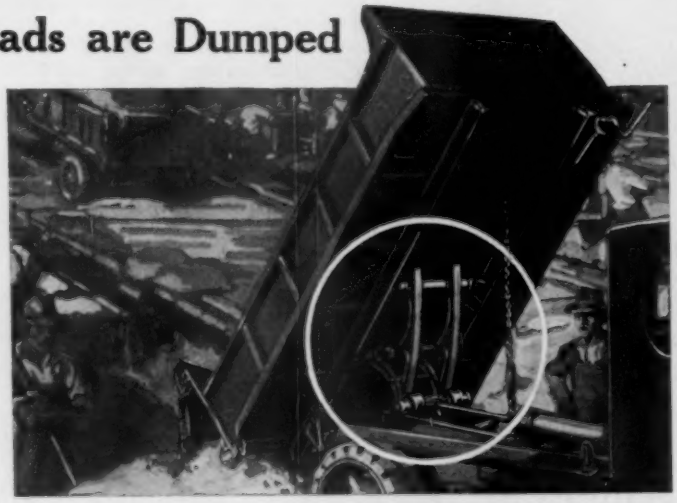
Bridgeport, Conn., equipped Fordson Tractors with H. P. Rigid Rail Tracks and Baker back fillers for leveling the city dumps. Each outfit saved fifteen men—more than $50 a day. H. P. "One-Man" Graders also work wonders in economical road and street building and maintenance.

GET PRINTED MATTER.

The
HADFIELD-PENFIELD STEEL Co
BUCYRUS · OHIO

Wherever Loads are Dumped

Truck manufacturers, dealers and owners are pretty well agreed that the simplicity of construction coupled with satisfactory performance and service—"until the last load is dumped"—has created for Wood dumping equipment its well-earned leadership.



Write for Catalog and colored Folder

A hoist for every make, model and capacity of Motor Truck

WOOD HYDRAULIC HOIST & BODY COMPANY
World's Largest Builder of Truck Dumping Equipment
7936 RIOPELLE STREET **DETROIT, MICHIGAN**

Every Minute a Street Is Closed It Costs Real Money!

Dowflake saves time!

Cures Concrete While You Mix It

Time is an important factor in public improvement work. Every day lost in opening up new streets means an irreparable loss to stores and other businesses located on that street.

A street that is closed is like a stream that is dammed up. Trade is stagnated. Other streets are over-burdened with traffic. Motorists suffer inconvenience and loss of time. Fire departments, police patrols and ambulances are hampered in their work.

Obviously it isn't possible to eliminate *all* of these annoyances, but it is possible, through the use of modern concrete-curing methods, to reduce to a minimum the time that such streets are closed to traffic. *Dowflake* Admixture Curing cuts the curing period of concrete approximately in half. It is added directly to the mix and permeates the entire mixture, resulting in a quick-setting, uniformly cured slab.

In one operation it eliminates much of the expense and trouble and loss of time which have always been experienced with earth-covering methods of curing. *Dowflake* Admixture Curing even supersedes *Dowflake* Surface Curing in most communities.

State, county and municipal officials and engineers are urged to write for full information regarding this improved method. Write for copy of free booklet, "How to Cure Concrete."

Dowflake is sold in 100-pound paper-lined burlap bags, moisture-proof and easy to handle.

THE DOW CHEMICAL COMPANY
MIDLAND : MICHIGAN

Branch Sales Offices:
90 West Street, New York City
Second and Madison Streets, Saint Louis

PATENTED FEBRUARY 17-1925
DOWFLAKE
CALCIUM CHLORIDE
DOW

Keeping Unpaved Streets in Perfect Condition

at low cost is a problem solved when you own the equipment shown above

Unpaved streets and cinder, gravel, or stone-surfaced streets can be kept smooth and solid and graded to shed water by the use of the machines shown above.

They are one-man machines powered by McCormick-Deering 10-20 tractors.

The roller is a four-purpose machine—roller, scarifier, planer, tractor. It is the most useful piece of equipment any city or village can own. The grader is very practical and rapid in street maintenance, and in winter is used to move snow.

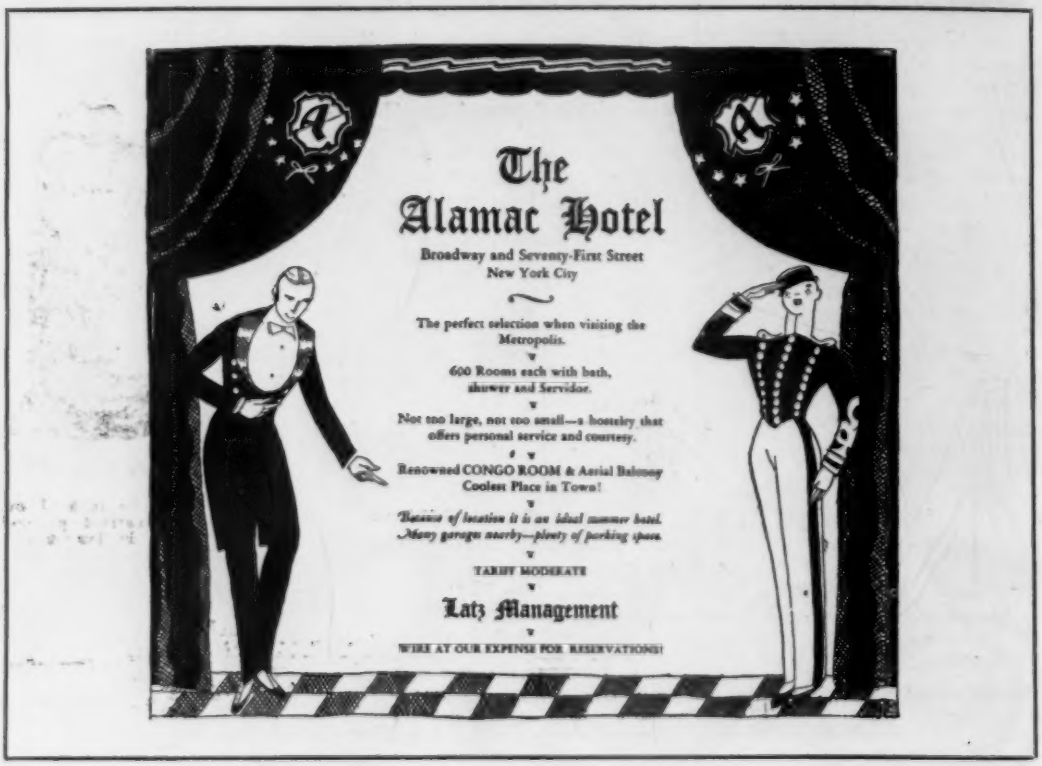
Galion can supply your needs for any type of Grader, Roller, or Scraper. Also for Tank and Sprinkling Wagons, Catch Basin Covers, Cast Iron Culverts, and other products.

Write for your copy of our 96-page Catalog

THE GALION IRON WORKS AND MFG. COMPANY, GALION, O.

The World's Largest Road Machinery Plant

GALION ROLLERS AND GRADERS


The
Alamac Hotel
Broadway and Seventy-First Street
New York City
The perfect selection when visiting the Metropolis.
600 Rooms each with bath, shower and Servidor.
Not too large, not too small—a hostelry that offers personal service and courtesy.
Renowned CONGO ROOM & Aerial Balcony Coolest Place in Town!
Because of location it is an ideal summer hotel. Many garages nearby—plenty of parking space.
TARIFF MODERATE
Latz Management
WIRE AT OUR EXPENSE FOR RESERVATIONS!

backfill

with a CATERPILLAR TRACTOR

REG. U.S. PAT. OFF.

THE BACKFILLER replaces the shovel! Gasoline replaces sweat! Amazing are the reductions in the cost of filling ditches when the "Caterpillar" track-type tractor starts shoving earth in wholesale lots.

Gas and electric companies fill their ditches. Cities fill their sewers. Road makers fill in around bridge heads. Garbage is shoved over the dump. Oil companies fill in their pipe line trenches . . . .

Ask about the "Caterpillar" track-type tractor and the backfiller.

There is a "Caterpillar" Dealer near you.

PRICES

2-TON $1850 *Peoria, Illinois*

THIRTY $3000 *Peoria or San Leandro*

SIXTY $5000 *Peoria or San Leandro*

CATERPILLAR TRACTOR CO.

Executive Offices: San Leandro, California, U. S. A.
Sales Offices and Factories:
Peoria, Illinois San Leandro, California
Distributing Warehouse: Albany, N. Y.
New York Office: 50 Church Street

BEST C. L. Best Tractor Co. — *Successor to* The Holt Manufacturing Company — HOLT

5427

better quicker cheaper

The latest improved

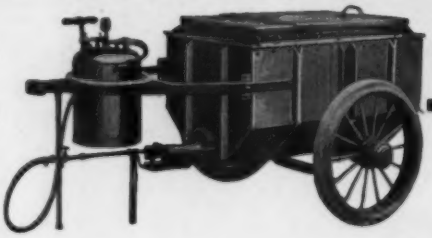
CONNERY'S

In Connery Tar and Asphalt Heaters contractors will find the very highest development of superior workmanship and design. Kettles are made in twenty styles and sizes, in capacities of 10 to 1000 gallons.

Send for our little "Blue Book" illustrating our many specials in Tar and Asphalt Heaters, Sand and Gravel Dryers, Oil Burning Heaters, Oil Burners, Pouring Pots, etc.

CONNERY & COMPANY, INCORPORATED

4000 N. SECOND ST. PHILADELPHIA, PA.



Detroit Mower Outfit shown equipped with W & K special 48" Highway Wheels.

This Sturdy Combination Cuts 40 Miles of Roadside Daily

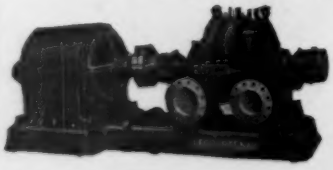
Every day the Detroit Mower and Fordson will cut the area that it is possible to do with three teams. Think of the saving on upkeep of Parks, Municipal Golf Courses, Playgrounds and the like when 15 to 30 acres can be trimmed in a day. This outfit cuts close into corners and other inaccessible places. Heaviest growths of obnoxious weeds and small brush are cut quickly and cleanly. Easily attached to the Fordson without alteration, the Detroit Mower is built to withstand the hardest kind of service.

For Full Information Write to

DETROIT HARVESTER COMPANY
5450 JEFFERSON AVE., WEST, DETROIT, MICH.

LECOURTENAY PUMPS

Centrifugal



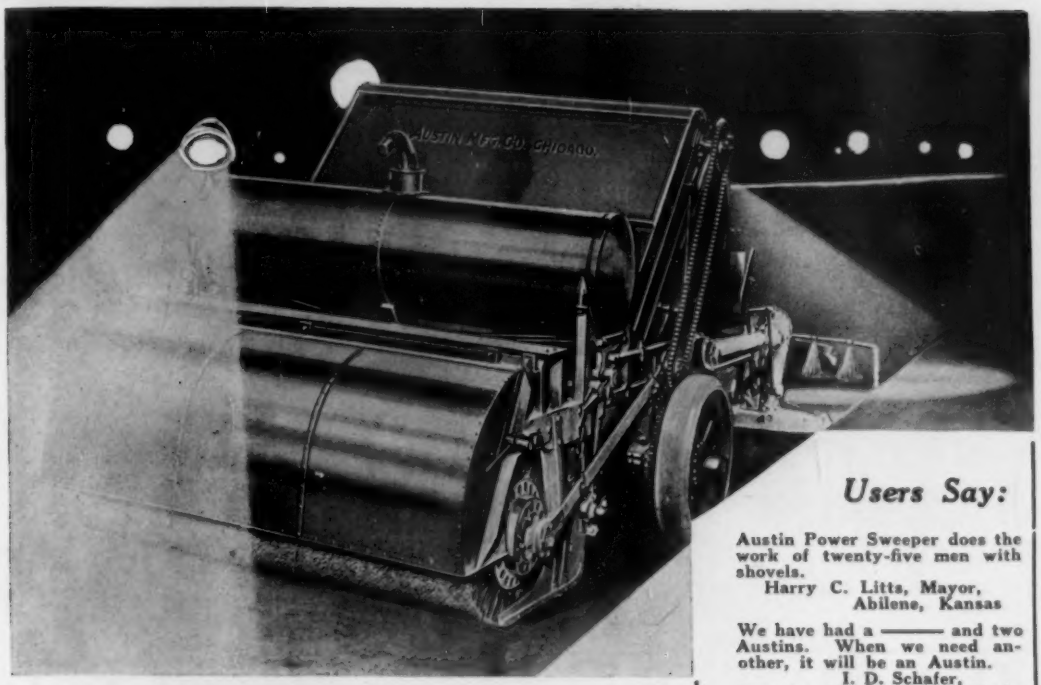
Pumping machinery for every kind of pumping service.

LECOURTENAY COMPANY
8 Maine Street, Newark, N. J.

Bound Volumes of THE AMERICAN CITY

A set of bound volumes of THE AMERICAN CITY makes a most valuable reference work for municipal offices, public libraries, etc., and we are in a position to supply all volumes from Volume I to Volume XXIX, inclusive. The prices of the volumes vary somewhat on account of the scarcity of some of the issues contained. We will be glad to quote terms on application.

THE AMERICAN CITY
443 Fourth Ave. New York City



Why Talk Costs in the Face of Death

Put it up to the Health Department. Let them tell you how much street filth costs.

Of course, it is fine to know Austin Sweepers clean your streets far more economically than hand labor, but the all-important fact is—your streets are not superficially dusted, they are *cleaned*. Cleaned of all the germ breeding spots of corruption.

The action of brooms—far more powerful than any humanly wielded broom—gets down under the surface leaving the street with a cleanliness reflected in the sparkling eyes of the youngsters whose health and lives it is your duty to safeguard.

Hundreds of cities such as these few quoted here, have seen the value of this form of sanitation.

In the interest of health, write for our Austin Motor Pickup Sweeper Catalog.

THE AUSTIN-WESTERN ROAD MACHINERY CO.

400 N. Michigan Blvd. Chicago, Ill.

Users Say:

Austin Power Sweeper does the work of twenty-five men with shovels.
Harry C. Litts, Mayor,
Abilene, Kansas

We have had a ——— and two Austins. When we need another, it will be an Austin.
I. D. Schafer,
Superintendent of Public Works
Lansing, Michigan

Five years old, giving best of service. R. N. Ostvig,
Street Commissioner,
Minneapolis, Minn.

I prefer the Austin Sweeper to any other. Upkeep is less.
W. J. Foster,
Superintendent of Streets,
Jacksonville, Fla.

When we buy a new sweeper, it will be an Austin.
H. F. Scharble,
Commissioner of Streets
& Public Improvements,
Kansas City, Kansas

Perfectly noiseless.
C. McDonald,
City Manager,
Abilene, Texas

Cleaner streets. Less labor trouble. More sanitary.
Fred D. Grannis,
Superintendent of Streets,
Ossining, New York

No dust in sweeping with Austin. 50 to 75% cheaper than by hand.
William G. Ewin,
Director of Public Works,
Wilkensburg, Pa.

In the 1926 Season we swept 1,046.84 miles of streets at $0.00052 per square yard. This includes every item of expense.
W. T. Tisher,
Commissioner of Public Works,
Duluth, Minn.

FREE
Send Your Catalog A.P.S.
Name .....
Address .....
Title .....

This New Booklet Will Interest You

IT clearly demonstrates how all weeds may be safely exterminated without retarding other important work. Your copy of Booklet "E" is ready. Send for it now.

Progressive maintenance work will not be delayed if weeds and all undesirable vegetation are exterminated with Atlas Non-Poisonous Weed Killer. It represents the only method of removing pernicious plant life without disturbing road or path surfaces, and it aids chemically in laying dust.

We invite you to submit your weed problems to us for expert advice concerning a practical, safe and economical solution.

Chipman Chemical Engineering Co., Inc.
Bound Brook, N. J.
Factories
Bound Brook, N. J. Palo Alto, Cal.
Houston, Tex. Clearing, Ill.

KILL WEEDS THE SAFE and EASY WAY

Especially Built for Police
-and wins instant popularity!
New Indian Scout 45

IDEAL for police service! Winning a hearty welcome everywhere! In actual tests the "45" has jumped from 5 to 65 miles an hour in only 10 seconds—has come to a dead stop from 65 miles an hour in only 5 3/5 seconds—and has reached 65 miles an hour in only 12 3/5 seconds from a standing start. Yet it is steady, dependable, easy to handle at all times!

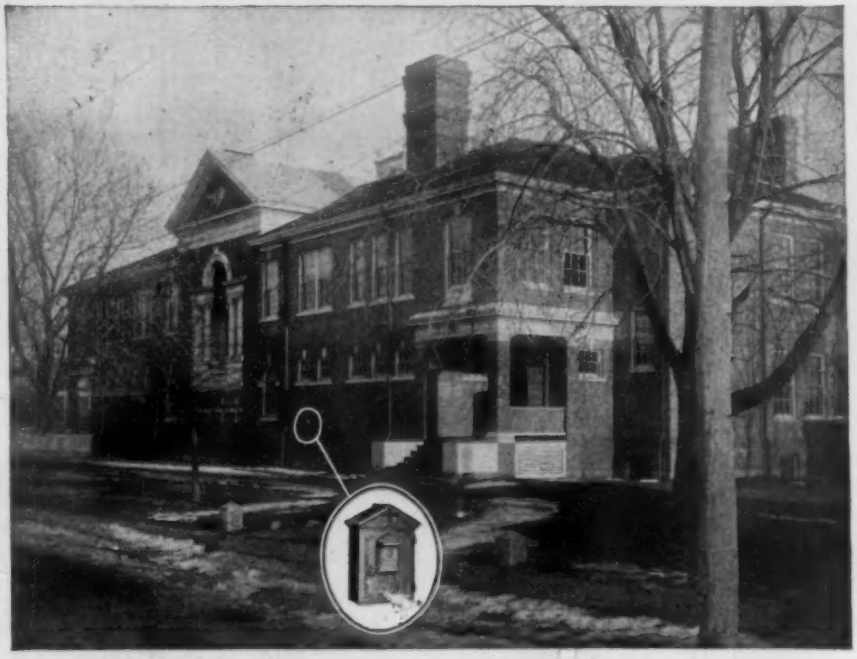
The Scout 45 has a rugged, super-powerful motor — large, oversize brake—smooth, easy riding features. Cuts through traffic easily—gets the jump on the fastest cars—stands the grind of heaviest patrol duty.

Write today for illustrated FREE booklet, telling the complete story of the Scout 45.

No obligation.

Indian Motocycle Co.
Dept. A-6 Springfield, Mass.

Protect the School Children From the Horror of Panic



Schoolhouse at Plymouth, Mass. equipped with Dualarm System

PANIC, the grim reaper of children's lives in schoolhouse fires, strikes with heavy hand in the modern fire-resistive building and the old wooden structure alike. Nobody knows when or where it will strike next; but whenever it does choose to strike it finds a fertile field in the highly imaginative mind of the school child. The smell of smoke from a balky furnace; a cry of "FIRE" from the trembling lips of a child; young minds quickly thrown into a frenzy; followed by small bodies tumbling down stairways and jammed at doors—such is PANIC, in the schoolhouse fire.

The fire department is the only organization capable of handling such a situation. Therefore if holocausts such as occurred at Collingwood, Peabody and Hockelaga, are to be averted, there should be ready and reliable means available for summoning this department. The first step in this direction is to equip each schoolhouse in your city with a municipal fire alarm box. If an interior alarm is desired, the Dualarm will take care of the requirements:—It sounds the interior alarm bells and sends an alarm direct to fire headquarters, simultaneously with one operation and without the aid of a local battery.

The only Company engaged exclusively in manufacturing, selling and installing Fire Alarm and Police Signaling Systems through its own organization

The Gamewell Company

Newton Upper Falls, Mass.

"A BOX A BLOCK"

San Francisco, Cal.

[APRIL 18, 1906]

The greatest conflagration ever experienced in San Francisco took place on this date.

The principal damage was done in the lowlands between the hills where were located most of the cheap lodging houses, tenement houses, warehouses and business buildings. This was also the scene of most of the fatalities.

The explosions of highly combustible materials located in various warehouses made the work of fire fighting doubly difficult. The work was further complicated by the failure of the city water system.

The fire authorities eventually commandeered all the gun powder and dynamite in the city in order to destroy several buildings and create a space in the path of the flames. This means proved effective in checking the fire.

Among the most famous buildings destroyed were the Palace Hotel, the St. Francis Hotel, the offices of practically every newspaper, the City Hall, Grand Opera House, Post Office, Leland Stanford University and the Merchants' Exchange. The total property loss was $200,000,000.

Great Fires of History

Like most great cities, San Francisco has American-LaFrance Fire Apparatus in its fire department.

Starting in with an order of 1 piece in 1910, San Francisco has steadily re-ordered until its fleet now numbers 55 pieces.

From coast to Coast and from Canada to the Gulf, municipalities are convinced of the superior performance and unexcelled stamina of American-LaFrance Fire Apparatus. They have come to this conclusion as a result of the actual performance of American-LaFrance Apparatus in their own fire departments.

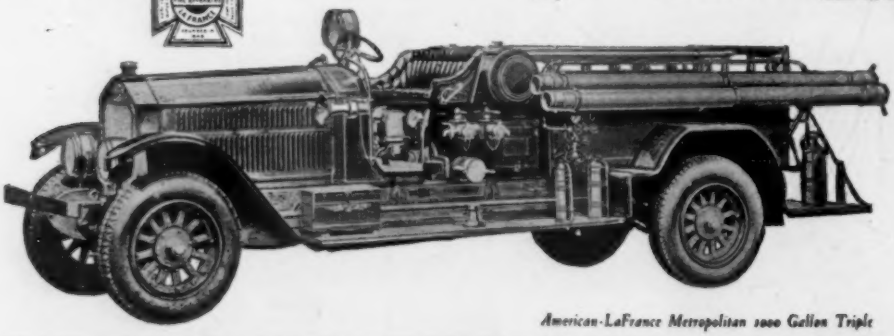
AMERICAN-LaFRANCE FIRE ENGINE COMPANY, INC.

Branches: New York, Philadelphia, Pittsburgh, Baltimore, Atlanta, Boston, Chicago

ELMIRA, N.Y.

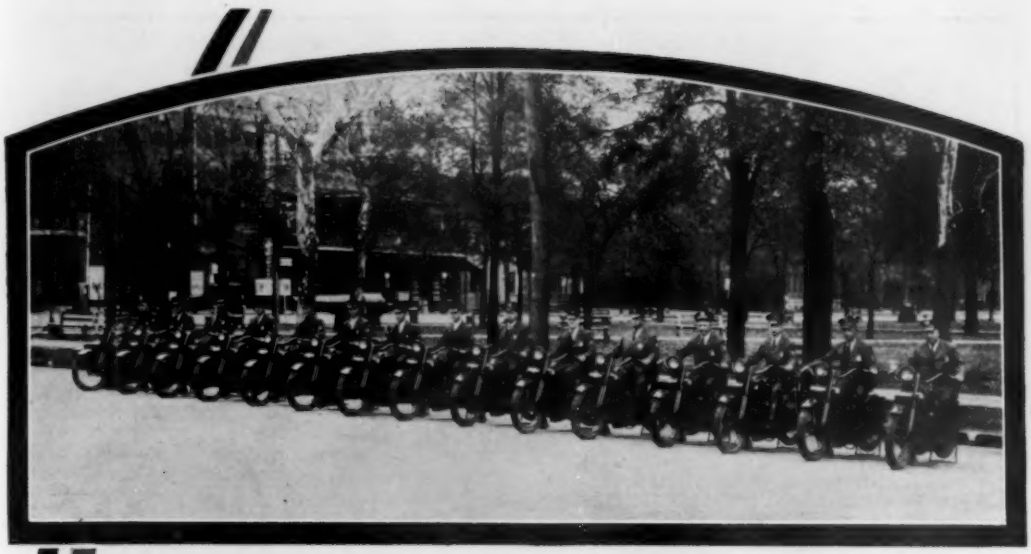
Canadian Factory: TORONTO, ONT
Montreal Vancouver

Branches: Los Angeles, Minneapolis, San Francisco, Portland, Denver, Dallas, Kansas City, Mo.



American-LaFrance Metropolitan 1000 Gallon Triple

Mention THE AMERICAN CITY—it helps.



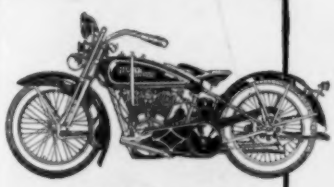
"Maintenance of the Harley-Davidson is minor, compared to other makes,"

says Chief Gill

THE police department of Columbus, Georgia, has had experience with various makes of motorcycles. This is what M. D. Gill, Chief of Police, has to say:

"I have tried a number of other makes of machines and find that the machine we are now using (Harley-Davidson) is the most economical. We are using the "big 74 inch motor" and find it equal to any situation that might arise. The machines perform wonderfully.

"The maintenance of the Harley-Davidson is minor, when compared to other makes of machines that were used under the same conditions. We have had other companies under-bid the Harley-Davidson, however we felt that it would be far cheaper for us to purchase the machine with the lesser up-keep cost."



The 1927 Twin is the greatest Harley-Davidson of all. Many improvements but no radical departures from time-tried design. Waterproof ignition unit for the first time on a motorcycle. Many other features. Yet prices are lower! Ask your local Harley-Davidson dealer to demonstrate.

In over 2600 other police departments throughout the country — state, county and municipal — Harley-Davidson is also the favorite motorcycle.

Write for special police literature giving all details.

HARLEY-DAVIDSON MOTOR COMPANY
DEPARTMENT M MILWAUKEE, WISCONSIN

HARLEY-DAVIDSON
Motorcycles

Protect Valuable City Trees

Now!

Now is the time to combat tussock caterpillars and other climbing, leaf-eating insects by banding city trees of all kinds with Tree Tanglefoot.

This harmless sticky compound remains effective three to four months. No climbing insect can cross it. One pound makes 15 lineal feet of three-inch banding.

Tree Tanglefoot comes ready for use. No special equipment is necessary. Apply it with a wooden paddle. Forestry experts and horticulturists everywhere use and recommend it. Unequaled for waterproofing crotches, wounds and cavities.

"We have used Tree Tanglefoot several years for banding trees to control the tussock caterpillar and to protect wounds, cavities, etc., with good success. It does all you claim for it."—C. Edmund Smith, Supt. Forestry and Landscape, Detroit, Mich.

Estimate your requirements and let us furnish quotations now

THE TANGLEFOOT COMPANY
GRAND RAPIDS, MICHIGAN

TREE TANGLEFOOT

ATTENTION
CHIEFS OF POLICE

EQUIP your department with the latest model light-weight new

BULLET-PROOF VESTS

They are flexible, evenly balanced.

The vest gives freedom of action to all parts of the body, covers all vital parts of the body, and looks like an ordinary vest.

Weight: 3½ to 4 pounds.

Guaranteed to stop any revolver or pistol bullet, including a .45-caliber Colt.

Write for the latest catalog of "Modern Police Equipment"

POLICE EQUIPMENT COMPANY
Manufacturers and Distributors of
MODERN POLICE EQUIPMENT
139 North Clark St., Room 801-2 Chicago, Ill.

Fool Proof

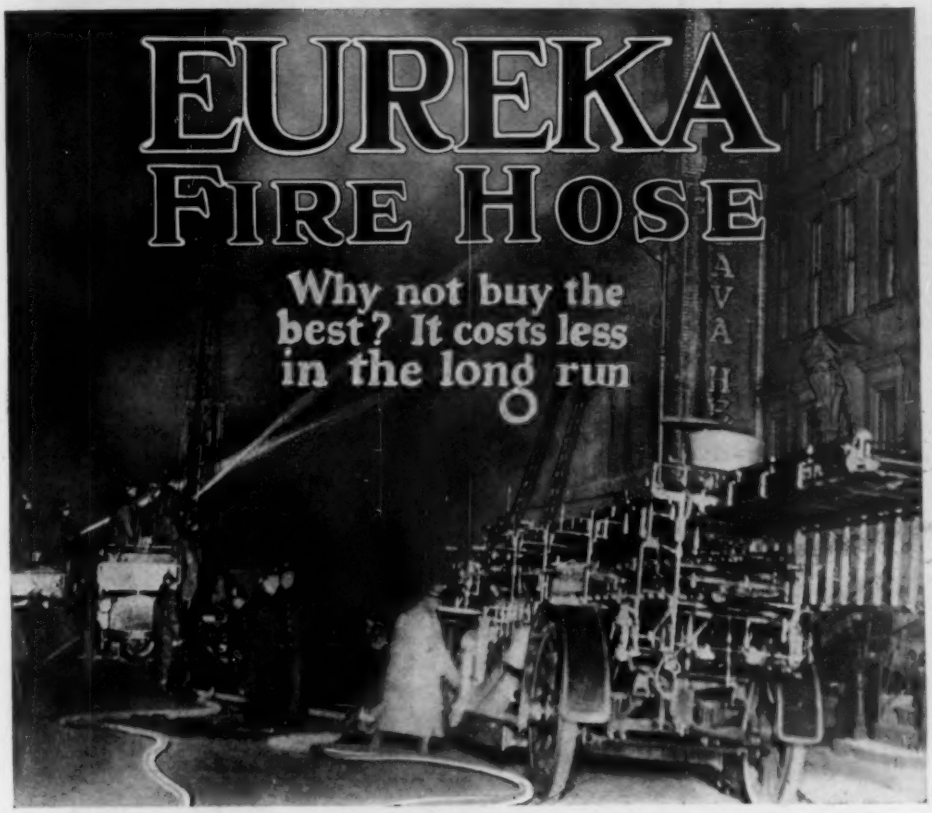
Patented Anti-freezing

Over seventy years' experience in the making of outdoor water devices is behind the Murdock Outdoor Bubble Font for

PARKS
PLAYGROUNDS
STREETS

Write for handsome booklet "What to Know About Outdoor Drinking Fountains"

The Murdock Mfg. & Supply Co.
Cincinnati, Ohio



You can't afford to buy fire hose on a price basis!

When you buy a fire hose you make an investment—an investment in efficient, dependable fire protection.

Can you afford to continue buying fire hose on a compromise basis, when often if but ten cents a foot were added to the purchase price you could buy the finest hose on the market—hose that will outlast the cheaper hose at least two to three times? Life and property depend upon the effective functioning of your hose. Why not stop experimenting and standardize on Eureka—standard of quality and service for over fifty years!

EUREKA FIRE HOSE MANUFACTURING CO.

50 Church Street — **New York City**

Atlanta *Boston* *Chicago* *Columbus* *Dallas* *Denver* *Des Moines* *Detroit*

TRADE MARK

Kansas City *Los Angeles* *Minneapolis* *Philadelphia* *Portland* *Syracuse*

796 FEET ABOVE BROADWAY

AN AHRENS-FOX RECORD

Inside the Fire Lines—Ahrens-Fox Piston Pumpers are known as the Hard Hitting Pinch Hitters.

ASK THOSE WHO KNOW

The Ahrens-Fox Fire Engine Co.
Cincinnati, Ohio

REX MIXERS and PAVERS

½-Bag Tilter	½ to 1-Bag 5-S
Full 1-Bag 7-S	2-Bag 10-S
3-Bag 14-S	6-Bag 28-S

And the Finest, Fastest Paver Ever Built —the Rex 27-E.

We'll send complete information on the Rex you want to know about—write us.

Chain Belt Co. Milwaukee, Wis.

BAKER

Backfillers for trench filling and leveling city dumps.

Snow Plows for motor trucks and tractors.

Self Loading Scrapers for tractor use.

Write for complete literature

THE BAKER MANUFACTURING CO.
503 Stanford Ave. Springfield, Ill.

Say "Winton"

—that's the password to a pleasant time in

Cleveland

When you step off the train ask for the Winton.

We'd like to be your hosts. Not just see that you are well-housed and well-fed, but see that everything is done to make your stay in Cleveland a delightful episode. That's the spirit here.

We'll see that every little detail contributing to your comfort and convenience is taken care of . . . from rushing your laundry to getting fourth row center aisle theatre tickets at the last minute.

I spend all my time here at the Winton. It's my job and my life. I'll be personally responsible for all these things.

Will you be my guest?

President

P. S. Rates are reduced. The Winton is by far the best hotel "value" in this United States.

New Rates

150	outside rooms	$2.50
100	outside rooms	3.00
100	outside rooms	3.50
100	outside rooms	4.00

W. Stiles Koones, *Mgr.*

HOTEL
WINTON
Cleveland
PROSPECT AT NINTH

Closed to Contamination!

Progressive cities, large and small, have installed R-S Vertico-Slant Fountains in playgrounds, parks, and other places where many people gather. The R-S "health bubbler" is a necessary sanitary safeguard.

Note where the R-S Nozzle is located—*lips can't touch it.* The possibility of contamination by means of lip-contact is positively eliminated. Everyone *must* drink sanitarily. Public health is safeguarded every day of the year.

All types of Sanitary Drinking Fountains, Bath and Plumbing Fixtures and Supplies, are included in the R-S Line. Write for illustrated catalog with prices, specifications and complete information.

RUNDLE-SPENCE MFG. CO.
53 Fourth St. Milwaukee, Wis.

RUNDLE-SPENCE

Yes sir

this new square terminal post means better protection!

"It's unclimbable — no bands around this Anchor Post on which tramps or children can get a foothold.

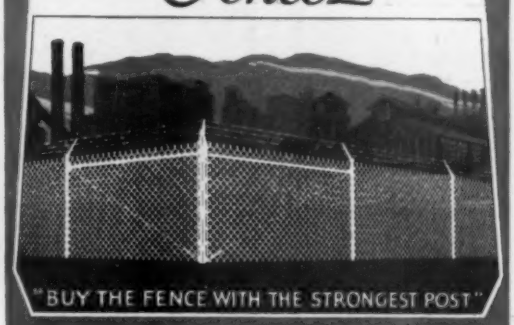
"And see how the fabric is fastened to the post from the *inside.* No one on the *outside* can get it off."

If you intend to purchase a fence it will pay you to get complete information regarding Anchor Fences and this new and important feature of construction. It will also pay you to remember that Anchor Fences are galvanized throughout and that their intermediate as well as terminal posts are the strongest on the market.

Anchor Sales and Erecting Service is nation-wide. A letter, phone call or wire puts it at your disposal.

ANCHOR POST FENCE CO.
9 East 38th St., New York, N. Y.
Branch Offices and Sales Agents in Principal Cities

ANCHOR
CHAIN LINK
Fences



AUTOMATIC ROTARY OSCILLATING IRRIGATOR

Model T-26 TURBO

A Portable Rainmaking Machine

Designed for a water pressure of 45 pounds. Weighs only 7 pounds. Discharging about 7 gallons per minute. 8 will cover one acre.

Ideal Sprinkler for Park Lawns and shrubberies. Covers an area 90 ft. in diameter (over 5,000 sq. ft.) from one placement. Distributes the water in mist-like sprays, dropping it evenly and gently like a rain.

It pays to know the difference between an AUTOMATIC OSCILLATING IRRIGATOR and a centrifugally driven lawn sprinkler.

The T-26 TURBO is a new model, having a tight enclosed grease-lubricated motor.
The OSCILLATED movement of the nozzle insures an even distribution of the water and the slow, ROTARY motion of the head allows time for it to soak into the soil before more is applied to the same place.
The heads are easily fitted to ¾-in. pipes for making permanent installations and they can be hidden among shrubbery.

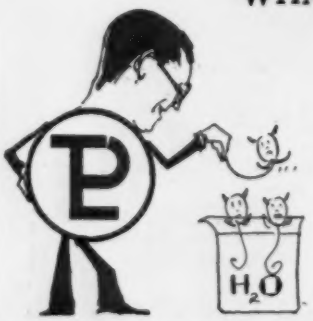
Price, $22.50 **Heads only, $20.00**
f. o. b. Woodbury

Samples sent for trial where there is an ample water pressure.

It is trouble-proof, durable and guaranteed. *Send for descriptive literature.*

CAMPBELL IRRIGATION COMPANY
Malcolm C. Ludlam, Prop. WOODBURY, N. J.

WHAT KIND OF BACTERIA CONTAMINATES YOUR WATER SUPPLY?



Regular systematic examination by the Pittsburgh Testing Laboratory gives you a constant and reliable check on the condition of your water-supply and warns you whenever correction is necessary.
All tests are made in accordance with American Public Health Association Standards.

Bulletin 25 tells how P. T. L. service is rendered. Send for it.

PITTSBURGH TESTING LABORATORY
PITTSBURGH PENNA.
BRANCH OFFICES IN PRINCIPAL CITIES

Send Us Your Name

—To Public Officials using Marriage Certificates, who will send us their name, we will send free, without cost, a sample of our Sunrise, Document Form

MARRIAGE CERTIFICATE

and a Catalog of our most complete line of Marriage Certificates. Don't overlook this offer—send today. No obligation whatever.

MEYER & BROTHER
56 W. Washington St. Chicago, Ill.

HONHORST TAR HEATERS

"Built for service"

ALL STYLES
Portable and Stationary
25 to 200 gallons

See our page in Street Construction Section Municipal Index for the Kettle you need

or

Write for Catalog

THE JOS. HONHORST CO.
1016 W. 6th St. Cincinnati, O.

Keeping City Streets Clean

IRON HORSE Street Cleaners and Scrapers are familiar sights on the streets of a large number of progressive cities all over the country. And scores of other municipalities are adopting *Iron Horse* Street Cleaning Equipment and Metalware yearly, as they have come to rely on its wear-resisting quality and the fact that it continues to give faultless service long after ordinary equipment has been relegated to the scrap heap.

You will be interested in our complete *Iron Horse* Metalware Catalog No. 921, showing our complete line, beautifully illustrated in color. *Write for your copy today.*

ROCHESTER CAN COMPANY

ROCHESTER, N. Y.

NURSERIES

SPECIALIZING IN TREES, SHRUBS & PLANTS FOR PARKS, CEMETERIES, PUBLIC GROUNDS, STREET PLANTING, ETC.

ANDORRA

Ornamentals exclusively distinctive in quality and variety, for street, park and all civic planting

We cater to the most discriminating trade.

Andorra Nurseries, Inc
Chestnut Hill, Pa

Have you seen ANDORRA?

SHADE TREES *for* CITY PLANTING

For Permanence,—we suggest Red or Pin Oak. Our stock of these varieties is excellent.

We grow Ornamental Trees and Shrubs. 225 acres. Secure our Wholesale Catalog.

THOMAS B. MEEHAN CO.
Wholesale Nurserymen
DRESHER, PA.

TREES and SHRUBS for CITY PLANTING

We grow them and ship direct. Many cities are planting trees for shade and to make a "City Beautiful"—is yours?

Write us for catalog.

FOREST NURSERY CO. Inc.
McMinnville Tennessee
Forest and Shade Trees and Ornamental Shrubs.

Ornamental Trees, Shrubs, and Hardy Perennials

A complete stock.
Quality unexcelled.
Send for price list.

HENRY KOHANKIE & SON
Painesville, Ohio

Do You Want Prices on Anything?

Readers of THE AMERICAN CITY desiring to secure catalog or price lists on any sort of machinery equipment or supplies for municipal or county work are invited to state their wishes to the Catalog and Price List Department, The American City, 443 Fourth Ave., New York. One letter to us will secure you the information you desire free of all charge, and at a considerable saving of time and correspondence.

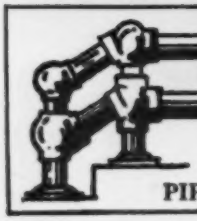
BOBBINK & ATKINS

Ask for Catalog

ROSES
EVERGREENS
RHODODENDRONS
TREES AND SHRUBS
OLD-FASHIONED FLOWERS
FRUIT TREES AND BUSHES

Visit Nursery

RUTHERFORD NEW JERSEY



IRON PIPE RAILINGS

When in the market for Pipe Railing for Stairs, Bridges or Retaining Walls, send us your drawings. We can quote you prices that will be worth considering. Dept. A

PIPE RAILING CONSTRUCTION CO., Long Island City, New York

Do you mention THE AMERICAN CITY when writing? Please do.

Framingham Nurseries

Ornamental trees, shrubs and evergreens for street and park planting.

FRAMINGHAM MASS.

TREES SHRUBS EVERGREENS

400 acres of hardy ornamentals, the largest assortment in Michigan.

We will be pleased to mail you our new "Planting Guide." Special prices to park and cemetery superintendents and other buyers for civic plantings.

PONTIAC NURSERIES
204 Architects Bldg.
DETROIT -:- MICHIGAN

ORNAMENTAL TREES, SHRUBS

ROSES, EVERGREENS, Etc.
Lowest Prices Available
CAR LOTS OUR SPECIALTY
Pleased to Quote
Choice Grass Seeds of Absolute Purity
FREE PRACTICAL PLANS
Designed without obligation for Parks and Cemetery.
We Pay all Transportation Charges
Send for Illustrated Catalog
J. Otto & Son Nursery Co.
Dept. A.C. 142 Nichols Street, Rochester, N. Y.

GENERAL NURSERY STOCK

THE STORRS AND HARRISON CO. TREES PLANTS SEEDS PAINESVILLE, OHIO. ESTABLISHED 1852 TRADE MARK

Trees, Shrubs, Roses, Hardy Perennials, etc. Catalogs Free. Packing and shipping facilities unexcelled. Pleased to quote you.

Nurserymen for 72 years

THE STORRS & HARRISON CO.
Box "K" Painesville, O.

GODWIN STEEL PAVING GUARDS

PROTECT THE EDGES OF STREET, ROAD, CURB & STREET RAILWAY PAVING. . . .

Write for Illustrated Catalog No. 23.

Various Sizes and Shapes adaptable to all types & character of paving.

W. S. GODWIN CO., Inc.
Race & McComas St., Baltimore, Md.

Established 1866

NAPERVILLE NURSERIES

Trees, Evergreens, Shrubs, Vines and Perennials

PLANT MATERIAL
FOR PARK, PLAYGROUND,
STREET IMPROVEMENT, LANDSCAPE
AND FORESTRY PROJECTS.

Two hundred and seventy-five (275) acres devoted exclusively to the growing of trees, shrubs, vines, evergreens and perennials.

NAPERVILLE, DU PAGE CO., ILLINOIS
Phone: Naperville 1
Catalog on Request.

GROWERS AND DISTRIBUTORS OF
THE BEST NURSERY STOCK

BUTLER IMPROVED STREET CANS

are sanitary, artistic and serviceable. The refuse thrown into the Butler trash can is out of sight. Once in, it stays in until taken out.

Write for latest literature.

The Butler Mfg. Co.
St. Anthony Fall Sta.,
Minneapolis, Minn.

DIRECTORY OF CONSULTING ENGINEERS, LANDSCAPE ARCHITECTS ETC

EXPERT ADVICE IS A REAL ECONOMY

The consultants whose cards appear on the following pages are listed below by States.

Lynch Bros., New Haven, Conn.
J. Rowland Bibbins, Washington, D. C.
Black, McKenney & Stewart, Washington, D. C.
George Burnap, Washington, D. C.
C. A. Bingham, West Palm Beach, Fla.
Alvord, Burdick & Howson, Chicago, Ill.
American Park Builders, Chicago, Ill.
Chicago Landscape Company, Chicago, Ill.
Chicago Paving Laboratory, Chicago, Ill.
Louis S. Cole, Chicago, Ill.
Condron & Post, Chicago, Ill.
Jacob L. Crane, Jr., Chicago, Ill.
W. H. Flood & Co., Chicago, Ill.
F. G. Gerdon, Chicago, Ill.
Griffenhagen and Associates, Ltd., Chicago, Ill.
Kelker, De Leuw & Co., Chicago, Ill.
Pearse, Greeley & Hansen, Chicago, Ill.
Randolph-Perkins Co., Chicago, Ill.
Edgar A. Rossiter Co., Chicago, Ill.
Van Trump Testing Laboratory, Chicago, Ill.
West Suburban Engineering Co., Chicago, Ill.
Chas. Brossman, Indianapolis, Ind.
S. A. Sulentic Consulting Engineer Co., Inc., Topeka, Kan.
Fay, Spofford & Thorndike, Boston, Mass.
Metcalf & Eddy, Boston, Mass.
Weston & Sampson, Boston, Mass.
J. French Paddock and Associates, Detroit, Mich.
G. J. Wagner & Company, Grand Rapids, Mich.
Delos F. Wilcox, Grand Rapids, Mich.
Pillsbury Engineering Co., Minneapolis, Minn.
R. T. Archer & Company, Kansas City, Mo.
Benham Engineering Co., Kansas City, Mo.
Black & Veatch, Kansas City, Mo.
Burns & McDonnell Engineering Co., Kansas City, Mo.
Haskins & Crawford, Kansas City, Mo.
Mullergren, Arthur L., Kansas City, Mo.
Wm. D. Hudson Company, St. Louis, Mo.
C. E. Smith & Co., St. Louis, Mo.
Conard & Busby, Burlington, N. J.
John A. Foulks, Newark, N. J.
F. A. Dunham, Plainfield, N. J.
Banks and Craig, New York, N. Y.
The Beeler Organization, New York, N. Y.
Thomas F. Bowe, New York, N. Y.
City-Wastes Disposal Company, New York, N. Y.
H. B. Cleveland, New York, N. Y.
Fairchild Aerial Surveys, Inc., New York, N. Y.
Fuller & McClintock, New York, N. Y.
A. E. Hansen, New York, N. Y.
James C. Harding, New York, N. Y.
Hasen & Whipple, New York, N. Y.
Higgins, J. Wallace, New York, N. Y.
Hill, Jr., Nicholas S., New York, N. Y.
George A. Johnson, New York, N. Y.
Landman Associates, New York, E. Y.
Leavitt & Son, Chas. W., New York, N. Y.
Mann & MacNeille, New York, N. Y.
Rudolph P. Miller, New York, N. Y.
Ray Palmer, New York, N. Y.
Perine & Company, New York, N. Y.
Clarence D. Pollock, New York, N. Y.
Alexander Potter, New York, N. Y.
Clyde Potts, New York, N. Y.
J. F. Sanborn, & C. L. Bogert, New York, N. Y.
Henry W. Taylor, New York, N. Y.
Technical Advisory Corp., New York, N. Y.
Universal Audit Company, New York, N. Y.
Thos. H. Wiggin, New York, N. Y.
Barker & Wheeler, Albany, New York
Airmap Corp. of America, Brooklyn, N. Y.
George C. Diehl, C. E., Inc., Buffalo, N. Y.
Park & Playfield Planning Assoc., Buffalo, N. Y.
Cyril E. Marshall, Hempstead, N. Y.
Walter Jackson, Mr. Vernon, N. Y.
Charles C. Hopkins, Rochester, N. Y.
Sibley, Carpenter & Associates, Syracuse, N. Y.
James M. Caird, Troy, N. Y.
E. S. Draper, Charlotte, N. C.
Gilbert C. White Co., Durham, N. C.
Barstow & McCurdy, Inc., Akron, Ohio
George B. Gascoigne, Cleveland, Ohio
R. Hunselman, Cleveland, Ohio
B. Ashburton Tripp, Cleveland, Ohio
Arthur H. Blanchard, Toledo, Ohio
Boulay-Harrison Co., Toledo, Ohio
Randall & Co., S. H., Toledo, Ohio
Albright & Mebus, Philadelphia, Pa.
J. W. Ledoux, Philadelphia, Pa.
Scofield Engineering Co., Philadelphia, Pa.
The J. N. Chester Engineers, Pittsburgh, Pa.
Morris Knowles, Inc., Pittsburgh, Pa.
F. B. Leopold, Pittsburgh, Pa.
W. E. Fuller, Swarthmore, Penna.
Edwin Wortham, Richmond, Va.

AIRMAP CORPORATION of AMERICA

An Engineering Service for Engineers by Engineers

The AIRMAP—The Engineer's Aerial Map for City Planning, Zoning, Water Supply Studies, Tax Purposes, Developments.

Aerial Photography in All Its Phases.

Sperry Bldg. **Brooklyn, N. Y.**

ALBRIGHT & MEBUS

Consulting Engineers

WATER SUPPLY — SEWAGE DISPOSAL — TOWN PLANNING

Municipal Engineering, Sewerage, Drainage, Refuse Disposal, Street Paving, Valuation, Reports, Design and Construction.

1502 LOCUST STREET **PHILADELPHIA, PA.**

BLACK, McKENNEY & STEWART

Member American Society of Civil Engineers

1653 Pennsylvania Ave., N. W., Washington, D. C.

CONSULTING ENGINEERS

CHAS. A. McKENNEY **Maj. Gen. W. M. BLACK, U. S. A., Retired** **JOHN STEWART**

MUNICIPAL, HIGHWAY, RIVER, HARBOR, PORT AND TERMINAL ENGINEERING

Examinations, Reports, Designs, Estimates, Organization and Administration

C. A. BINGHAM

Past President City Managers Association **Member American Society Civil Engineers**

Twenty-five years as city official. Last twelve years as city manager in Massachusetts, New York, Ohio and Florida

Now open for engagements as consultant on city-manager government. Advisor to city commissions, city managers and civic organizations on governmental surveys and city-manager campaigns.

WEST PALM BEACH, FLA.

THE AMERICAN CITY DIRECTORY OF CONSULTANTS

Alvord, Burdick & Howson
John W. Alvord Chas. B. Burdick
Louis R. Howson
ENGINEERS for
Water Works — Sewage Disposal
Water Purification — Drainage
Flood Relief — Appraisals
Sewerage — Power Generation
CHICAGO HARTFORD BLDG.

Benham Engineering Co.
CONSULTING ENGINEERS
Water Works, Sewerage, Electric Light and Power, Pavements, Reports and Appraisals
GUMBEL BLDG. KANSAS CITY MO.

PARKS
Old parks redesigned; New areas located and planned to benefit traffic, school and housing conditions.
GEORGE BURNAP
Washington, D. C.

American Park Builders
Landscape Architects and City Planners
Comprehensive city planning. Zoning. Land Plotting.
201 E. Ontario St., Chicago, Ill.

J. ROWLAND BIBBINS
Transportation-Consultant
2301 Connecticut Ave. Washington, D. C.
Surveys Organized—Traffic Plans.
Transit and Routing Improvements.
Motor-Transport, Railroad and Port-Terminal Development. Valuations.
Coordination with the City Plan.
Experience in 23 Cities.

Burns & McDonnell Engineering Co.
McDonnell-Smith-Baldwin-Lambert
Consulting Engineers
Waterworks, Sewerage, Lighting, Appraisals, Rate Investigations.
Kansas City, Mo., Interstate Bldg.
Los Angeles, Cal., West. Pacific Bg

E. T. ARCHER & CO.
Consulting Engineers
Steam & Hydraulic Power Plants, Water, Sewerage, Paving, Roads, Appraisals, Testimony, Reports.
New England Bldg. Kansas City, Mo. — City Bank Bldg. Shreveport, La.

Kansas City Mo. Mutual Bldg.
BLACK & VEATCH
CONSULTING ENGINEERS
Sewerage, Sewage Disposal, Water Supply, Water Purification, Electric Lighting, Power Plants, Valuations, Special Investigations and Reports.

JAMES M. CAIRD
Assoc. Am. Soc. C. E.
CHEMIST and BACTERIOLOGIST
Office and Laboratory
Cannon Building, Troy, N. Y.
Water Analysis and Tests of Filter Plants

BANKS & CRAIG
51 East 42nd St., New York City
State Chamber of Commerce Bldg. Harrisburg, Pa.
Municipal, hydraulic and sanitary engineers.
Design, operation, valuation.

Arthur H. Blanchard
M. Am. Soc. C. E. *M. E. Inst. Can.*
Highway Transport Consultant
Traffic Control Expert
Consulting Highway Engineer
Richardson Building
Toledo, Ohio

THE J. N. CHESTER ENGINEERS
J. N. Chester D. R. Davis J. F. Labson
J. T. Campbell E. E. Bankson
Water Works, Water Purification, Rate Investigations and Appraisements, Sewerage, Sewage Disposal, Operation of Properties, Expert Testimony.
Union Bank Bldg. Pittsburgh, Pa.

BARKER & WHEELER
36 State Street — Albany, N. Y.
11 Park Place — New York City
Water Supply, Sewerage, Sewage Disposal, Power — Public Utility and Industrial Valuations and Rates.

BOULAY-HARRISON CO.
Civil Engineers
TOLEDO OHIO
912½ Broadway
Sewerage, Sewage Disposal, Water Supply, Water Filtration Pavements, Reports

CHICAGO LANDSCAPE COMPANY
Landscape Architects and Contractors
22 W. Monroe Street, Chicago

Barstow & McCurdy, Inc.
Ohio Bldg., Akron, Ohio
Consulting Engineers
Specializing in Sewerage, Drainage, Water-Supply Works, and Railroad Grade Separation.

THOMAS F. BOWE
Consulting Engineer
Designs, Valuations, Inspections, Reports — Water, Sewerage, Treatment of Sewage, Industrial Plants
110 William Street, New York City

Chicago Paving Laboratory
L. Kirschbraun — Hugh W. Skidmore
Gene Abson
Consulting and Inspecting Engineers
PAVEMENTS AND MATERIALS
Consultation, Testing — Inspection, Investigation, Research — Specifications, Design
536 Lake Shore Drive Chicago, Ill.

THE BEELER ORGANIZATION
Operating, Traction and Traffic Investigations. Routing Surveys. Valuations, Operation, Management.
52 Vanderbilt Avenue, New York

CHAS. BROSSMAN
Mem. Am. Soc. C. E., Mem. Am. Soc., M. E.
Consulting Engineer
Reports, Investigation Plans, Specifications, Water Supply, Sewerage and Disposal, Lighting Plants—Supervision of Construction and Reduction in Operating Cost. Appraisals—Expert Testimony.
New Chamber of Commerce Bldg.
Indianapolis, Ind.

City-Wastes Disposal Co.
Specialists in Drainage, Sewerage and Sewage Disposal.
Reports and Estimates. Surveys, Plan and Supervision.
New York, 45 Seventh Avenue

GEORGE C. DIEHL, C. E., Inc.
Consulting Engineers
Sewerage and Sewage Disposal Works, Water Supply, Bridge Construction, Municipal Lighting, Boulevard Illumination, City Planning, Landscaping, Subdivisions, Highway Construction, Grade Crossing Elimination, Traffic Signaling, Aerial Surveys, Investigations, Reports, Appraisals, Expert Testimony, Computations.
555-583 Ellicott Square — Buffalo, N. Y.

H. BURDETT CLEVELAND
Consulting Sanitary Engineer
Associated with
CORNELIUS C. VERMEULE
Consulting Engineer
Sanitary Investigations and Reports, Design and Supervision, Water Supply, Water Purification, Sewerage and Sewage Disposal.
New York — 225 Broadway

Fay, Spofford & Thorndike
Consulting Engineers
Investigations Reports Designs
Engineering Supervision Valuations
Port Developments Bridges
Water and Sewerage Systems
44 SCHOOL STREET, BOSTON

GRIFFENHAGEN & ASSOCIATES, Ltd.
Established 1911
An organization of specialists in
Municipal Administration, Finance, Accounting, Budget Making, Engineering and Economic Investigations.
155 E. Superior St., Chicago, Ill.
Mills Building, Washington, D. C.

14 E. Jackson Blvd., Chicago
Studio: Glenview, Illinois
LOUIS S. COLE
Landscape Architect and City Plan Consultant
Zoning & Zoning Ordinances, Land Subdivisions, Park, Cemeteries.

Inspections - Tests - Specifications - Reports
Walter H. Flood & Co.
Chemical Engineers
PAVING AND ENGINEERING MATERIALS
832 E. 44th St. Chicago, Ill. — 321 Daniel B'ldg. Jackson, Miss.

New York City — 116 West 39th St.
A. E. HANSEN
Hydraulic & Sanitary Engineer
Design & Supervision of Construction
Sewerage — Water Works
Sewage Disposal — Water Purification
Drainage — Water Works Valuation
Expert Services in Litigation

CONDRON & POST
Theo. L. Condron — Chester L. Post
CIVIL ENGINEERS
Bridges Buildings, Foundations
Monadnock Building
CHICAGO
Telephone: Harrison 0069

JOHN A. FOULKS
CONSULTING ENGINEER
18-20 Beaver St. — Newark, N. J.
Specialist in Municipal Engineering and Public Improvements, including Organization, Management, Investigations, Reports, Plans, Estimates, Specifications and Supervision.

James C. Harding,
Consulting Engineer and Sanitary Expert.
Water Supply and Purification. Refuse Disposal. Sewerage and Sewage Disposal. Investigations of Epidemics. Water Works Valuations. Supervision of Construction and Operation.
New York City. — 170 Broadway

JACOB L. CRANE, JR.
Municipal Development Engineer
CITY AND TOWN PLANNING—ZONING
Municipal Utilities
Land Subdivision — Housing
Wrigley Building — 400 N. Michigan Ave.
CHICAGO

WESTON E. FULLER
Weston E. Fuller — Errol W. Deebler
CONSULTING ENGINEERS
Water Works, Sewerage Works, Flood Control, Drainage, Supervision of Constructions and Operation, Rates, Valuation.
SWARTHMORE, PENNA.

HASKINS & CRAWFORD
C. A. Haskins — H. W. Crawford
R. O. Ruble
Consulting Engineers
Civil — Sanitary — Hydraulic
1007 Baltimore Ave., Kansas City, Mo.

Member Amer. Society Landscape Architects
E. S. DRAPER
Landscape Architect and Engineer
Charlotte, N. C. — Atlanta, Ga.

Gascoigne, George B.
Consulting Sanitary Engineer
W. L. Havens — A. A. Burger
F. W. Jones — F. C. Tolles
Sewerage and Sewage Disposal
Water Supply and Purification
Treatment of Industrial Wastes.
Cleveland, Leader-News Building

HAZEN & WHIPPLE
CONSULTING HYDRAULIC and SANITARY ENGINEERS
WATER SUPPLY and SEWERAGE
Allen Hazen — Malcolm Pirnie
C. M. Everett — L. M. Babbitt
26 W. 44th Street, — New York

F. A. Dunham
Municipal Engineering
Roads, Pavements, Sewers and Supervision. Also Surveys, Developments, Topography and Land Subdivision.
109 Park Ave. — Tel. 610
PLAINFIELD, N. J.

GORDON, F. G.
Successor to Maury & Gordon
Consulting Engineers
Water Works — Sewerage
Power Plants — Appraisals
Chicago, Monadnock Building

J. WALLACE HIGGINS
Assoc. M. Am. Soc. C. E.
CIVIL AND LANDSCAPE ENGINEER
Municipal Engineering, Sewerage, Parks, Cemeteries, Subdivisions, Topographic Surveys, Title Surveys, Estimates, Supervision
70 East 45th St. — NEW YORK

W. R. Conard — J. B. Buzby
CONARD & BUZBY
BURLINGTON, N. J.
Specialists on Water Works—
Materials — Inspections — Designs
Specifications — Reports — Tests

FAIRCHILD AERIAL SURVEYS, INC.
An organization of specialized engineers, photographers and aviators, assisting municipal executives in practical application of aerial photography *to their needs*
FAIRCHILD SYSTEM TAX MAPS PERMIT REDUCTIONS IN TAX RATES WITH ACTUAL INCREASE IN GROSS REVENUES.
270 West 38th Street — New York City

CHARLES C. HOPKINS
CONSULTING ENGINEER
349 Cutler Bldg., Rochester, N. Y.
Water supply and purification. Sewerage, Wastes disposal. Municipal Engineering. Expert testimony and appraisals. Plans, estimates, supervision.

Wm. D. Hudson Company
Consulting Engineers
Grade Crossing Elimination
Investigation, Plans and Estimates of Cost,
919 Louderman Building, St. Louis, Mo.
Affiliated with Harland Bartholomew and Associates.

R. HUSSELMAN
CONSULTING ENGINEER AND PUBLIC UTILITY CONSULTANT
Design and Construction
Valuations and Expert Testimony
Rate Investigations and Reports
827 Union Trust Bldg., CLEVELAND, OHIO

WALTER JACKSON
Fare and Motor-Bus Consultant
143 Crary Avenue
Mt. Vernon New York

GEORGE A. JOHNSON
CONSULTING ENGINEER
Water Supply and Purification, Sewerage and Sewage Disposal, Refuse Collection and Disposal.
150 Nassau Street, NEW YORK

KELKER, DE LEUW & CO.
Consulting Engineers
111 W. Washington St., Chicago, Ill.
Transportation Studies, Traffic Reports for Cities

MORRIS KNOWLES, INC.
Engineers
PITTSBURGH — CLEVELAND
Municipal and Public Utility Engineers, City Planning, Zoning

LANDMAN ASSOCIATES
Taxation, Accounting, Municipal Surveys & Systems
52 Vanderbilt Ave. New York

Chas. W. Leavitt & Son
Civil and Landscape Engineering
City Planning
285 Madison Ave.
NEW YORK CITY

LEDOUX, J. W.,
Consulting Engineer
Water Works Water Power
Power Plants
Reports, Designs; Construction Supervision, Valuation, Arbitration, Rate Schedules.
112 N. Broad St., Phila., Pa.

Alex. S. Lynch John F. Lynch
Members Am. Soc. of C. E.
LYNCH BROTHERS
Consulting Civil Engineers
Designers and Builders of Swimming Pools
Box 283 New Haven, Conn.

MANN & MAC NEILLE
Architects and City Planners
70 East 45th Street
New York

CYRIL E. MARSHALL
M. Am. Soc. C. E.
Consulting Engineer
Hempstead, N. Y.
Water Supply Town Planning
Sewerage Pavements
Garbage Disposal Drainage

RUDOLPH P. MILLER
Consulting Engineer
Building Laws, Zoning, Building Construction, Fire Protection
342 Madison Ave. New York City

Arthur L. Mullergren
Consulting Engineer
Specialist in
Electric Light, Power and Water Pumping
770 BOARD OF TRADE BLDG.
KANSAS CITY, MO.

J. FRENCH PADDOCK AND ASSOCIATES
Civil and Landscape Engineers
Harry L. Hudson Civil Engineer
J. French Paddock Landscape Engineer
Water Works, Water Purification, Sewerage, Sewage Disposal, Pavements, Investigations, Reports, Designs, Supervision, Inspection, City Planning, Parks, Townsites, Resort Projects, Subdivisions.
Suite 507 Fine Arts Bldg., Detroit, Michigan.

RAY PALMER
Consulting Engineer
Appraisals, Valuations, Rates, Franchise and other Public Utility or Industrial Problems.
New York Office Chicago Office
52 Vanderbilt Ave. 231 S. La Salle St

PARK AND PLAYFIELD PLANNING ASSOCIATES
Public and Private Developments
505 Delware Ave. Buffalo, N. Y.

FULLER & McCLINTOCK
ENGINEERS
NEW YORK, - - 170 BROADWAY
Philadelphia, Pa., Pennsylvania Bldg. 15th and Chestnut Streets
Kansas City, Mo. Walsix Bldg., 600 Walnut Street

NICHOLAS S. HILL, JR.
CONSULTING ENGINEER
WATER SUPPLY—SEWAGE DISPOSAL—HYDRAULIC DEVELOPMENTS
Reports, Investigations, Valuations, Rates, Design, Construction, Operation, Management, Chemical and Biological Laboratories
112 East 19th Street New York City

THE AMERICAN CITY DIRECTORY OF CONSULTANTS

Pearse, Greeley & Hansen

Hydraulic & Sanitary Engineers

Reports, Designs, Supervision, Appraisals, Water Supply, Sewerage, Water Purification, Sewage Treatment, Refuse Disposal.

Chicago, Ill., 6 N. Michigan Ave.

PILLSBURY ENGINEERING CO.

Minneapolis Saint Paul

Power Plants, Central Heating Systems, Sewers, Sewage Disposal Waterworks, Paving, Street Illumination, Appraisals, Rate Investigations.

CLARENCE D. POLLOCK

Member Am. Soc. C. E.

Consulting Engineer

Pavements, Highways, Drainage. Sewerage, Town Planning and General Municipal Problems.

Reports, Specifications, Supervision

Park Row Bldg., New York City

Alexander Potter, C. E.

Hydraulic and Sanitary Engineer

50 Church Street

New York

(Hudson Terminal) Tel. Cortlandt 5501

Clyde Potts

30 CHURCH ST., NEW YORK

Civil and Sanitary Engineer

Sewerage and Sewage Disposal Works, Hydraulics, Water Works, Filtration, Reports, Plans and Estimates.

R. H. RANDALL & COMPANY

Engineers

TOLEDO, OHIO

Geodetic and topographic surveys and maps of large areas. Services rendered include over ninety per cent of American CITY SURVEYS.

RANDOLPH - PERKINS CO.

Engineers—Managers

Housing, City Planning, Water Supply and Sewage Disposal.

L. K. Sherman, Pres.

1444 First National Bank Bldg., Chicago

J. F. Sanborn & C. L. Bogert

Consulting Civil Engineers

Reports — Designs

Water Supply — Concrete Structure

Sewerage — Tunnels

30 Church St., New York, N. Y.

SCOFIELD ENGINEERING CO.

Philadelphia

Consulting Engineers

An organization of thoroughly trained experts with a wide, successful experience in—Public Service Properties, Refrigeration, Industrial and Textile Plants, Municipal Improvements.

SIBLEY, CARPENTER & Associates

Consulting Engineers — Architects

City Plan Advisers — Statisticians

Traffic Surveys, Municipal Markets, Parks, Landscape Plans, Golf Courses, Cemeteries, Institution Grounds, Industrial Layouts, Appraisals, Expert Testimony

New York — 445 S. Warren St.,

State License — Syracuse, N. Y.

C. E. SMITH & CO.

CONSULTING ENGINEERS

2073 Railway Exch. Bldg., St. Louis, Mo.

Investigations, reports, appraisals, expert testimony, bridge and structural work, railway problems, electrification, grade crossing elimination, foundations, highways, docks, water supply, river and flood protection, drainage and sanitation, power plants.

THE S. A. SULENTIC CONSULTING ENGINEER COMPANY, INC.

224 New England Bldg. — Topeka, Kansas

Ellsworth, Kansas

Power Plants — Water Works

Electric Lighting — Sewerage System

Heating & Ventilation — Paving

Refrigeration

Henry W. Taylor

Water Supply — Sewerage

Hydraulic Developments

149 Broadway, N. Y. City

B. ASHBURTON TRIPP

LANDSCAPE ARCHITECT

Mem. Am. Soc. of Landscape Architects

Industrial Towns, Subdivisions, Parks, School and Institution Grounds

Guardian Bldg., Cleveland, Ohio

Van Trump Testing Laboratory

Paving and Testing Engineers

Isaac Van Trump, A. M. Am. Soc. C. E.

LABORATORIES:

2337 South Pauline St., Chicago, Illinois — 344 Gazette Bldg., Little Rock, Arkansas

Paving and Engineering Materials, Chemical and Physical Tests. Inspection and Supervision. Specifications and Consultations. Experts in Paving Litigation.

G. J. Wagner & Company

Consulting Engineers

Grand Rapids, Mich.

Public Utility and City Management, Construction, Operation, Rates.

West Suburban Engineering Co.

E. W. HEIPLE, President.

CHAS. M. SCULLIN, Sec'y-Treas.

Municipal Engineers

WESTERN SPRINGS, HINSDALE, CLARENDON HILLS, ILLINOIS

Chicago Ave. & Washington St., Hinsdale, Illinois

Telephone, Hinsdale 1011

WESTON & SAMPSON

CONSULTING ENGINEERS

Hydraulic and Public Health Engineering.

Engineering and Laboratory Investigations.

Supervision of Purification Plants

14 Beacon Street, Boston, Mass.

Gilbert C. White Co.

Consulting Engineers

Waterworks — Streets

Power Plants

DURHAM, N. C.

THOS. H. WIGGIN

CONSULTING ENGINEER

415 Lexington Ave., New York City

Reports, Designs, Supervision, Valuation: Water Supply, Sewerage, Flood Control, Tunnels.

EDWIN WORTHAM

Engineer

Valuations of Public Utilities. Water—Light and Power—Gas—Street Railway—Telephones—Buses, Management Investigations.

Grace-Amer. Bldg., Richmond, Va.

F. B. LEOPOLD

CONTRACTOR AND BUILDER OF

MUNICIPAL FILTRATION PLANTS, GRAVITY FILTERS, PRESSURE FILTERS AND WATER SOFTENING PLANTS

HOUSE BUILDING :: :: :: PITTSBURGH, PA., U. S. A.

METCALF & EDDY

ENGINEERS

Harrison P. Eddy — Charles W. Sherman — Arthur L. Shaw — Frank A. Marston
John P. Wentworth — Harrison P. Eddy, Jr. — Almon L. Fales — E. Sherman Chase

Water, Sewage, Drainage, Municipal Refuse and Industrial Wastes Problems, Laboratory

BOSTON — STATLER BUILDING

PERINE & COMPANY

ACCOUNTANTS AND AUDITORS

Municipal Audits — Accounting Investigations — Systems

We Especially Invite Correspondence with Municipal Heads

Singer Building, 149 Broadway, New York City — EXPERIENCED AS ACCOUNTANTS SINCE 1898 — Investment Bldg., 15th and K. Sts., N. W., Washington, D. C.

OVER HALF A CENTURY IN CHICAGO

THE EDGAR A. ROSSITER CO.

CONSULTING ENGINEERS

160 North La Salle St., Chicago

Water supply, sewerage, and sewage disposal, drainage, farm and levee-pumping plants, electric light systems, pavements, track elevation, tunnels, mining.

TECHNICAL ADVISORY CORPORATION

Consulting Engineers

15 Park Row, New York

Specialists in Municipal Engineering

Zoning Plans — Comprehensive City Plans — Street Systems — Traffic Regulation — Grade-crossing Elimination — Industrial Surveys.

UNIVERSAL AUDIT COMPANY

Accountants and Auditors—Industrial Engineers

SINGER BUILDING — (Hanover 8374) — NEW YORK

Specialists in Municipal Auditing, Accounting, Financing and Related Engineering Problems.

Wiedeman and Singleton, Inc.

(Successors to Paul H. Norcross)

CONSULTING ENGINEERS

WATER WORKS, SEWERS, SEWAGE DISPOSAL
APPRAISALS, VALUATIONS, REPORTS

CANDLER BUILDING — ATLANTA, GA.

Public Utilities for Public Service

DELOS F. WILCOX, Ph.D

Public Utility Advice from Public Point of View

436 Crescent St., Grand Rapids, Mich.

SPECIALISTS IN ANALYSES

Service-at-Cost Proposal — Public Ownership Plans
Public Utility Valuations — Problems of Public Policy

INDEPENDENT Concrete Sewer PIPE

Makes permanent, low cost sewers. Sizes, 24 to 108 inches. Built locally. Easier to lay. Write for details.

INDEPENDENT CONCRETE PIPE CO., INDIANAPOLIS, IND.

INDEX TO ADVERTISEMENTS IN THIS ISSUE

For Directory of Consulting Engineers, Landscape Architects, Etc., see pages 178, 179, 180, 181, 182, 183

This index is published as an aid to the reader, but the publishers assume no responsibility for errors or ommissions.

*Abendroth & Root Mfg. Co..... 112
*Acme Road Machinery Co..... 142
Ahrens-Fox Fire Engine Co..... 172
Airmap Corp. of America..... 178
*Albright & Mebus..... 178
Aldrich Pump Co..... 112
*Allis-Chalmers Mfg. Co..... 48
*Alumoyd Sign & Signal Co..... 126
*American Brass Co..... 108
*American Cast Iron Pipe Co... 49
Amer. Institute of Steel Constr. 84
*Amer.-La France Fire Eng. Co. 168
American Steam Pump Co..... 118
*American Steel & Wire Co..... 138
American Tel. & Tel. Co..... 77
*American Well Works.....104–105
Anchor Post Fence Co..... 173
Andorra Nurseries..... 176
*Armco Culvert Mfs. Assn..... 137
*Austin Manufacturing Co..... 165
*Automatic Registering Mch. Co. 87

*Badger Meter Mfg. Co.....36–37
*Baker Mfg. Co..... 172
*Barber Asphalt Co..... 83
Barber-Greene Co..... 86
*Barrett Co..... 85
*Bartlett & Snow Co., C. O..... 20
*Bausman Mfg. Co..... 120
Bi-Lateral Fire Hose Co..... 124
Bingham, C. A..... 178
Bissell & Co., F..... 58
Black, McKenney & Stewart... 178
Bobbink & Atkins..... 176
*Braxmar Co., Inc., C. G..... 128
Breakers, The..... 124
*Buffalo Meter Co.....108b
*Buffalo-Springfield Roller Co... 134
*Busch-Sulzer Bros. Diesel Eng. Co.....108b
ButlerMfg.Co., Cleveland,O..106-107
Butler Mfg. Co., Minneapolis.. 177

Campbell Irrigation Co..... 174
Casey-Hedges Co..... 126
Cast Iron Pipe Publicity Bureau 17
Caterpillar Tractor Co..... 163
Celite Products Co..... 109
Cement Lined Pipe Co..... 108
*Central Foundry Co..... 8–9
Chain Belt Company..... 172
Chevrolet Motor Co..... 92
*Chicago Bridge & Iron Wks.... 57
*Chicago Concrete Post Co..... 99
*Chicago Pump Co..... 68
*Chipman Chemical Eng. Co.... 166
*Clark Co., H. W..... 23
*Clarkville Fdy. & Mach. Works. 108
*Clay Products Ass'n..... 60
Cleveland Tractor Co..... 97
*Coldwell Lawn Mower Co..... 81
Coldwell-Wilcox Co..... 110
Cole Mfg. Co., R. D..... 64
*Columbian Iron Works.....10–11
Conard & Buzby..... 180
Condon, Thos. R..... 128
*Connery & Co., Inc..... 164
*Continental Products Co..... 139
*Cook, Inc., A. D..... 41
Copper & Brass Research Assn.. 42
*Crouse-Hinds Co..... 127
*Cutter Works, George..... 184
Cyclone Fence Co..... 100
Darling Valve & Mfg. Co..... 66
*Decarie Incinerator Corp..... 16
Dee Co., Wm. E.....108b
De Laval Steam Turbine Co.... 47
Detroit Harvester Co..... 164
*Diehl, Geo. C..... 179
Dixon Crucible Co., Joseph.... 118
Dobbie Fdy. & Mach. Co..... 112
Donaldson Iron Co..... 108
*Dorr Co..... 19
*Dow Chemical Co..... 161
Eastern Clay Products Assn... 60
*Eddy Valve Co..... 35
*Electric Railway Equip. Co.... 125
*Electro Bleaching Gas Co..... 33
Elkhart Foundry & Machine Co. 132
*Ellis & Ford Mfg. Co.....108b
Empire Elec. & Water Co., Inc. 40
Engineering News-Record..... 78
*Esco Manufacturing Co..... 129
Etnyre & Co., E. D..... 111
*Eureka Fire Hose Mfg. Co..... 171
Everhot Mfg. Co..... 148
*Evernu Century Sign Co..... 130
Everson Filter Co..... 108
*Everwear Mfg. Co..... 119

*Fabric Fire Hose Co..... 146
*Fairbanks-Morse Co.....71–72
*Fairchild Aerial Survey, Inc.... 180
*Fate-Root-Heath Co..... 130
*Federal Meter Corp..... 22
Firestone Tire & Rubber Co.... 91
*Ford Meter Box Co..... 24
Forest Nursery Co..... 176
Framingham Nurseries..... 177
*Fuller & McClintock..... 181
*Fulton Iron Works Co..... 63

Galion Iron Works & Mfg. Co.. 162
*Gamewell Co..... 167
*Gamon Meter Co..... 29
*General Chemical Co..... 70
*General Electric Co..... 123
*Godwin Co., W. S..... 177
Gorco Mechanical Spreader Co. 111
*Graham Bros..... 94
*Graver Corp..... 39

*Hadfield-Penfield Co..... 160
Hanks Co., Fred. W..... 101
Hanline Bros..... 136
Hanson Co., The C. H..... 128
*Harley-Davidson Motor Co.... 169
*Harrington-Seaberg Corp..... 136
*Hazard Manufacturing Co..... 139
*Heil Co., The..... 140
*Hersey Manufacturing Co..... 27
*Highway Trailer Co..... 144
*Hill, Nicholas S..... 181
Hill-Standard Co.....14–15
*Honhorst Co., Jos..... 174
*Horni Signal Mfg. Corp..... 122
Hotel Alamac..... 162
Hotel Belvedere..... 154
Hotel Pennsylvania..... 136
Hotel Winton..... 172
*Huber Manufacturing Co..... 148
Hunt Co., Robert W..... 70
Huntsville Fibre & Veneer Wks. 153
*Hvass & Co., Inc., Chas..... 146

*Ideal Power Lawn Mower Co... 117
*Independent Concrete Pipe Co. 183
Indiana Air Pump Co..... 166
*International Filter Co..... 110
*International Harvester Co..... 93
International Steel Tie Co..... 124

Jaeger Machine Co..... 124
*Johnson, Inc., Edward E..... 108

Kelly Well Co..... 102
*Kennedy Valve Mfg. Co..... 31
*Kentucky Rock Asphalt Co.... 150
*Keystone Driller Co..... 44
*Kinney Mfg. Co..... 144
Kohankie & Son, Henry..... 176
Lay Company, The Joseph..... 156
*Layne & Bowler Mfg. Co..... 5
*Leadite Co., The..... 38
Lead Lined Iron Pipe Co..... 58
Lecourtenay Co..... 164
*Leopold, F. B..... 182
Line-O-Graph Co..... 130
*Lithoprint Co. of N. Y..... 128
*Littleford Bros..... 148
*Lock Joint Pipe Co..... 46
Logan Co..... 130
*Lovell & Co., F. H..... 126
*Ludlow Valve Mfg. Co..... 32
*Lyle Culvert & Road Equip. Co. 150–151

Mack Trucks, Inc..... 138
Manufacturers Appraisal Co... 88
Marion Insulated Wire & Rubber Co..... 132
*Mathieson Alkali Works, Inc... 7
McIntosh & Seymour Corp.... 43
McNear & Co., C. W..... 136
*McWane Cast Iron Pipe Co.... 52
*Meadows, Inc., W. R..... 152
*Medart Mfg. Co., Fred..... 121
Meehan Co., Thos. B..... 176
Metcalf & Eddy..... 183
Meyer & Brother..... 174
*Michigan Pipe Co..... 66
*Michigan Valve & Fdy. Co..... 54
*Mitchell Manufacturing Co.... 118
Monarch Tractors Corp..... 90
Montauk Manor..... 158
Montgomery & Co..... 68
Mueller Co..... 53
Municipal Signal & Equip. Corp. 134
*Murdock Mfg. & Supply Co.... 170
*Naperville Nurseries..... 177
National Assn. of Marble Dirs.. 89
*National Cast Iron Pipe Co.... 68
Nat'l Paving Brick Mfrs. Ass'n. 143
*National Meter Co..... 21
National Steel Fabric Co..... 96
*National Traffic Appliance Corp. 135
*Nat'l Water Main Cleaning Co. 62
Natural Rock Asphalt Corp.... 145
*Nelson Iron Works, N. P..... 95
*Neptune Meter Co..... 73
*Newark Concrete Pipe Co.....108b
Niagara Metal Stamp Corp.... 122
Northern Conveyor & Mfg. Co. 154
*Norwood Engineering Co..... 18
Novo Engine Co..... 154

*Ohio Traffic Devices Co..... 126
Otto & Son Nursery Co., J..... 177

*Pacific Flush-Tank Co..... 60
*Penna Lawn Mower Works, Inc. 116
*Penna. Salt Mfg. Co..... 54
Perine & Co..... 183
Petroleum Iron Works Co..... 108
Phoenix Meter Co..... 58
Pipe Railing Construction Co.. 176
*Pitometer Co., The..... 34
*Pittsburgh-Des Moines Steel Co59–66
*Pittsburgh Equitable Meter Co. 25
Pittsburgh Testing Laboratory.. 174
Police Equipment Co..... 170
Pontiac Nurseries..... 177
Portland Cement Assn..... 141

Rawls Mfg. Co.....12–13
Reade Mfg. Co..... 49
Reading Meter Repair Co..... 56
*Republic Flow Meters Co..... 82
Roberts Filter Mfg. Co..... 110
Rochester Can Co..... 175
*Rochester Street Signal Co..... 126
*Rome Mfg. Co..... 140
*Rossiter Co., Edgar A..... 183
*Ruberoid Company, The..... 55
Rundle-Spence Mfg. Co..... 173
*Russell Grader Mfg. Co..... 142

*Sanitation Corporation..... 60
*Simplex Valve & Meter Co..... 185
Simplex Wire & Cable Co..... 134
*Smith Mfg. Co., A. P..... 30
*Solvay Sales Corp..... 159
Sparling, R. W..... 66
*Standard Mfg. Company..... 128
Standard Oil Co. of Indiana.... 157
Standard Oil Co. of N. Y..... 138
Standard Traffic Signal Co..... 137
Sterling Engine Co.....108a
Sterling Pump Works, Inc..... 110
*Stewart Iron Works Co..... 128
Storrs & Harrison Co..... 177
*Sullivan Machy. Co..... 45
Sweet Iron Works, A. L..... 158

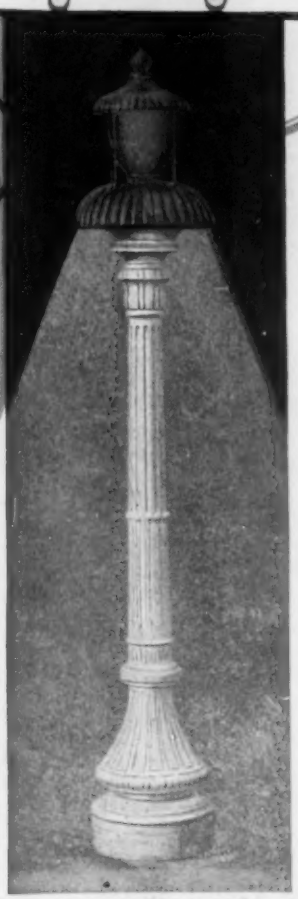
Tanglefoot Co., The..... 170
*Technical Advisory Corp..... 183
Texas Company..... 2
*Tokheim Oil Tank & Pump Co. 131
*Trackson Co..... 98
Trail-it Co..... 142
Traverse City Iron Works..... 109
*Truscon Steel Co.....80–154
*Turbine Sewer Mach. Co..... 69
*Union Iron Products Co..... 124
*Union Metal Mfg. Co..... 113
*Union Water Meter Co..... 26
*Universal Audit Co..... 183
Universal Power Shovel Co.... 156
*U. S. Cast Iron Pipe & Fdy. Co..3–50
*Van Dorn Iron Works Co..... 112
Van Gilder Water Meter Co.... 110
*Victaulic Co. of America..... 51
*Vogt Bros. Mfg. Co..... 103
Walker Cement Products..... 56
*Wallace & Tiernan Co., Inc.. 74–75
Wamblu Corp.....114–115
Warren Foundry & Pipe Co.. 67–70
Warren-Knight Co..... 130
*Waterous Fire Engine Wks., Inc. 64
*Welsbach Traffic Signal Co.... 133
*Westinghouse Elec. & Mfg. Co.. 184
Whirl-Over Swing Co., Inc..... 120
*Whitehead & Kales Co..... 153
Wiedemann & Singleton, Inc... 183
Wilcox, Delos F..... 183
Willamette Iron & Steel Wks.. 154
*Wood & Co., R. D..... 28
Wood Hydr. Hoist & Body Co.. 160
Wood-Regan Instrument Co.... 76
*Worthington Pump & Machy. Corp..... 65
*Yeomans Brothers Co..... 69
*Youngstown Boiler & Tank Co. 61

CONSULT THE MUNICIPAL INDEX FOR 1927

In addition to the advertising messages which will b e found in this issue of THE AMERICAN CITY on the pages as indicated above, condensed catalogs of those marked* will be found in THE MUNICIPAL INDEX, the 700 page reference volume for city, town and county officials published annually by THE AMERICAN CITY.

HOW MANY STRANGERS COME TO YOUR CITY?

Tourists —*See What?*



WE have become a nation on wheels. The tourist sees your city and judges it largely by your streets and the ease with which he can find his way through —safely.

What impression does he take with him as he leaves? At night your case rests on your street lighting system.

The Westinghouse Red-Head Beacon has an important place in any adequate street lighting system. Placed at dangerous intersections, it flashes the "slow and careful" command. It also floods a circle of ground with white light, which enables the driver to better judge the beacon's distance, and which lights his way around it.

The stranger is unacquainted with your streets. He depends upon you to warn him of dangerous points.

Westinghouse Electric & Manufacturing Company
South Bend Works South Bend, Indiana
Sales Offices in All Principal Cities of the United States and Foreign Countries

Westinghouse

X92710

Ornamental Street Lighting

SIMPLEX
Equipment for the Filter Plant

PRESENT-DAY practices in the modern filtration plant demand reliable and complete control.

Simplex Rate of Flow Controllers, as the heart of the filter, maintaining a constant rate of effluent from the beds—Simplex gauges telling a graphic story of the rate of filtration and loss of head in combination with the Simplex Venturi Type meters on the raw water and discharge mains—give this absolute control.

It is essential to good engineering to keep this combination intact, thus preserving a proper balance and giving the ultimate result according to Simplex engineering standards.

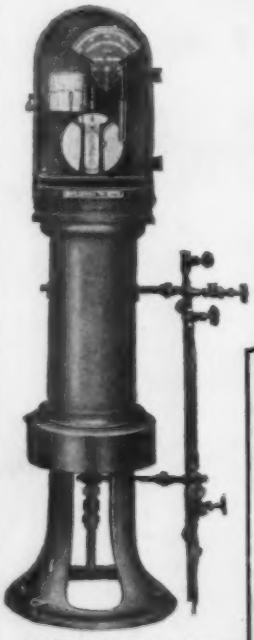
Complete installations at: Buffalo, Baltimore, Washington, Cleveland, Kansas City, Memphis, Wheeling and Grand Rapids.

SIMPLEX Filter Gauges may be had in many combinations of Indicating, Recording and Totalizing.

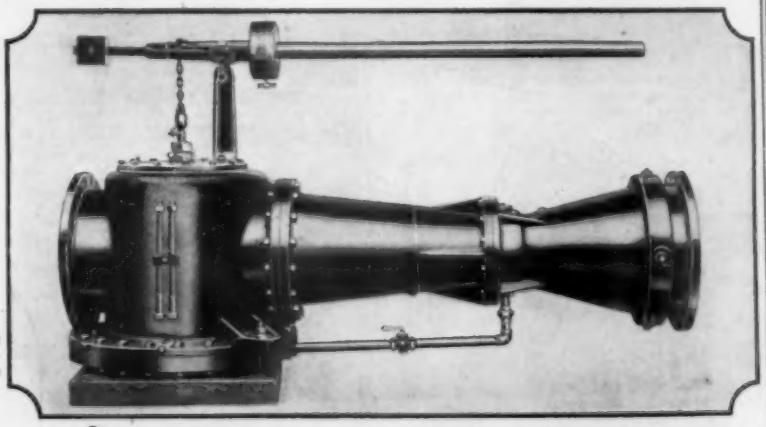
Remembrance of service lasts long after the cost has been forgotten.

Simplex Valve & Meter Company
6743 Upland St. **Philadelphia, Pa.**

Manufacturers of meters, rate controllers of Venturi type, gauges, air and vacuum valves, and other water-works devices.



SIMPLEX Venturi Type Meter—Indicates, Records and Totalizes the Rate of Flow.



SIMPLEX Filter Rate of Flow Controller—adaptable to large and small filter plants from 30-inch effluent to 3-inch.